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Ontario. Legislative Assembly

SESSIONAL PAPERS

VOL. XLIX.—PART VIII.

THIRD SESSION

OF THE

FOURTEENTH LEGISLATURE

OF THE

PROVINCE OF ONTARIO

SESSION 1917

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No. 5 Report of the Inspector of Division Courts for the year 1916. Presented to the Legislature, March 2nd, 1917. *Printed.*

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No. 18 Report of the Board of Governors of the University of Toronto for the year 1916. Presented to the Legislature, February 20th, 1917. *Printed.*

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No. 27 Report upon the Neglected and Dependent Children of the Province for the year 1916. Presented to the Legislature, April 6th, 1917. *Not Printed.*

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No. 29 Report of the Department of Agriculture for the year 1916. Presented to the Legislature, April 6th, 1917. *Printed.*

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No. 32 Report of the Ontario Agricultural and Experimental Union for the year 1916. Presented to the Legislature, April 6th, 1917. *Printed.*

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No. 53 Report of the Provincial Auditor for the year 1916. Presented to the Legislature, February 22nd, 1917. *Printed.*

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No. 55 Report of the British Red Cross Fund for the year 1916. Presented to the Legislature, March 2nd, 1917. *Printed.*

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No. 59 Statement as to distribution of the Revised and Sessional Statutes for the year 1916. Presented to the Legislature, February 20th, 1917. *Not printed.*

No. 60 Return to an Order of the House of April 19th, 1916, that there be laid before the House:—A Return shewing, 1. If the T. & N. O. Railway quoted any special rate not authorized by its tariff or has been a party to the quotation of a special rate from any point or points in Ontario or Western Canada. 2. If so, to what shipper or shippers has such rate been given. Presented to the Legislature, February 20th, 1917. Mr. *Munro.* *Not Printed.*

No. 61 Copies of Orders-in-Council made under the authority of the Department of Education Act, or of the Acts relating to Public Schools, Separate Schools or High Schools. Presented to the Legislature, February 20th, 1917. *Not Printed.*

No. 62 Report of the Nickel Commission. Presented to the Legislature, March 26th, 1917. *Printed.*

No. 63 Return of an Address to His Honour the Lieutenant-Governor of the 16th February, 1917, praying that he will cause to be laid before this House, a Return:—1. Shewing all correspondence

(including telegrams) since January 1st, 1916, passing between the Government of the Province of Ontario or any member, officer or official thereof, and the Government of the Dominion of Canada and any officer or official thereof in reference to the machine guns purchased out of the moneys of the Province of Ontario. 2. All correspondence since January 1st, 1916, passing between the Government of the Province of Ontario, or any member, officer or official thereof, and the Imperial Government, and any officer or official thereof, in reference to machine guns purchased out of the moneys of the Province of Ontario. Presented to the Legislature, March 1st, 1917. Mr. *Bowman. Not Printed.*

No. 64 Return to an Order of the House of the 26th February, 1917, for a Return shewing:—1. How many charters or licenses have been issued to racing associations operating in Ontario since the year 1912. 2. What are the names of the racing associations or companies and the dates of the issue of the licenses or charters respectively. Presented to the Legislature, March 1st, 1917. Mr. *Carter. Printed.*

No. 65 Return to an Address to His Honour the Lieutenant-Governor of the 11th April, 1916, praying that he will cause to be laid before this House a Return shewing:—1. Copies of all letters or telegrams, since the 1st January, 1915, which have passed between the Government or any official or agent thereof, and the International Nickel Company or the Canadian Copper Company or any officers or officials thereof, in reference to the damages done to the property of the farmers and others interested in the lands adjacent to the plant of the Canadian Copper Company. 2. Of all letters and telegrams which have passed between the Government, or any officer or official thereof—and particularly the Departments of Lands, Forests and Mines and of Agriculture—and Mr. Chas. McCrea, M.P.P., of Sudbury, in reference to the matters aforesaid or the operations of the International Nickel Company or the Canadian Copper Company, and the damage being done to the property in the vicinity of the operations of the said companies; and particularly the correspondence between either of the Departments and Mr. McCrea and Mr. Ponton and Mr. Jarvis, Valuators for the Canadian Copper Company. 3. Of all Orders in Council withdrawing lands from sale for agricultural purposes, at the instance or suggestion of the Canadian Copper Company. Presented to the Legislature, March 2nd, 1917. Mr. *Carter, Printed.*

No. 66 Return to an Order of the House of the 19th February, 1917 for a Return shewing how many patients were regularly cared for in the Whitby Asylum during the year 1916. Presented to the Legislature, March 2nd, 1917. Mr. *Wigle. Printed.*

No. 67 Return to an Order of the House of the 23rd February, 1917, for a Return of copies, 1. Of the pay-rolls of the Industrial Department of the Reformatory for the Porvince of Ontario, commencing November 1st, 1915, and ending October 31st, 1916, specifying the nature of the services rendered by those whose names appear in the Return. 2. Of the monthly payments by the Industrial Department of the Reformatory for the Province of Ontario to persons whose names do not appear upon the monthly pay-roll of the Industrial Department, specifying the nature of the services rendered by those whose names appear in the Return. Presented to the Legislature, March 2nd, 1917. Mr. *Bowman. Not Printed.*

No. 68 Return to an Order of the House of the 3rd April, 1916, for a Return shewing: 1. The number of acres occupied by *bona fide* settlers on the lands purchased from the Government by Willis K. Jackson *et al.* under agreement bearing date the 14th day of June, 1912, particularizing the number of acres occupied each year since the date of the said agreement. 2. The number of settlers occupying such lands since the date of such agreement and the number respectively occupying the same for each year since the date of said agreement and the number of acres occupied by each settler. 3. The number of settlers who have lived up to the requirements of The Free Grant and Homestead Act and the regulations thereunder, and the number in default. 4. The number of farms required to be cleared by the Minister under Clause 4 of said agreement, and the actual number of such farms cleared, the amount of work performed, and the number and kind of buildings erected in accordance with the request of said Minister. 5. The number and extent of roads, bridges and other improvements, designating the nature of such improvements, required by the Minister to be done under Clause 5 of said agreement and the number and extent of such roads, bridges and other improvements completed in accordance with such request. 6. The number of schools and school buildings erected under Clause 6 of said agreement, and whether same are established and erected to the satisfaction of the Minister, also the location of such schools, particularizing those which are not satisfactory to the Minister and the reason for such dissatisfaction. 7. The amount of work required to be performed under Clause 7 of said agreement that has actually been performed, particularizing the nature and cost of such work, and the date each work was commenced and completed. 8. The number of acres cut over by the purchaser under Clause 8 of said agreement, and whether same cleared in accordance with the terms of said clause and to the satisfaction of the Minister; and whether the terms of said clause as to leaving 20 acres of wood for each farm have been complied with, and the kind of wood so left. 9. Whether all the timber cut by the purchaser has been manufactured in the townships of Kendry and Haggart,

and if not, the amount not so manufactured and the amount of timber disposed of outside of such townships, and to whom the same was sold. 10. The amount of timber that has been purchased from the settlers by the purchaser, and upon what terms were such purchases made; and how much and at what rate were the settlers paid for cutting and removing timber; and what was the rate charged to the settler for the use of the purchaser's teams. 11. The number and date of sales that have been made by the purchaser to settlers and the terms of such sales and copies of all agreements between such settlers and purchasers and as to whether the same have been approved of by the Minister. 12. The number of patents issued to settlers under Clause 13 of said agreement. 13. The extent of the lands upon which patents have been issued to the purchaser under Clause 14 of said agreement, and the nature and cost of the buildings built on same for which such patents granted. 14. All correspondence between the Government or any officer or official thereof and the purchaser or any of them, or any officer or official of such purchaser, and between the Government or any officer or official thereof and any settlers, relating to the whole or any part of the subject matter of the said agreement. Presetned to the Legislature, March 6th, 1917. Mr. *Lang*. *Not Printed.*

No. 69 Return to an Order of the House of the 16th February, 1917, for a Return shewing:—1. All statements furnished by the Canada Copper Company, International Nickel Company, Mond Nickel Company, and any other company producing nickel, under section 8 of The Mining Act, respecting taxation since the 1st of January, A.D. 1915. 2. All reports from any Government Mine Assessor, made under the provisions of The Mining Act, in respect to the mining operations of the Canada Copper Company, the International Nickel Company or the Mond Nickel Company, particularly with reference to the taxes to be paid by the said companies, or any of them, under The Mining Tax Act. 3. All correspondence since the 1st day of January, 1915, between the Minister of Lands, Forests and Mines, or the Provincial Treasurer, or any officer or official of the Government, and the Canada Copper Company, the International Nickel Company, the Mond Nickel Company, and any other companies producing nickel, or any officer or solicitor for or on behalf of the said companies, or any of them, with reference to the amount of taxes or royalties paid or to be paid by the said companies or any of them, to the Provincial Treasurer of the Province, in respect of the ore mined or the mining operations carried on by them in the Province of Ontario. Presented to the Legislature, March 16th, 1917. Mr. *Carter*. *Not Printed.*

No. 70 Return to an Order of the House of the 9th March, 1917, for a Return shewing:—1. The number, kind and cost of buildings comprised in the Burwash Prison Farm property. 2. What is the number of acres of land belonging to or included in the Bur-

wash Prison Farm property, and of such land, how many acres are under cultivation, and how many acres are used for the purpose of pasture. 3. How many prisoners are there at Burwash Prison Farm. 4. What is the number of employees at the Burwash Prison Farm, and what is the amount of salary paid to each employee. 5. Were cattle or other animals shipped from the Burwash Prison Farm in the year 1916, and if so, what was the number so shipped, the total value of such shipments and the amount paid as freight charges thereon. 6. Were cattle or other animals brought to the Burwash Prison Farm from other places in the year 1916, and if so, what was the number so brought, and what were the names of the places from which said cattle or other animals were brought. Presented to the Legislature, March 16th, 1917. Mr. *Mageau. Printed.*

No. 71 Return to an Order of the House of the 16th February, 1917, for a Return:—1. Shewing the names of all the Townsites established by the T. & N. O. Ry. Commission. 2. Shewing all the townsite lands sold by the T. & N. O. Ry. Commission on or after July 29, 1916, the towns in which they were situated, and the amounts received for each. Presented to the Legislature, March 20th, 1917. Mr. *Bowman. Not Printed.*

No. 72 Copies of contracts with The Kinleith Paper Company, Limited, St. Catharines, Ontario; The Georgetown Coated Paper Mills, Limited, Georgetown; The Provincial Paper Mills Company, Limited, Toronto; authorized by Order in Council dated February 20th, 1917. Presented to the Legislature, March 21st, 1917. *Printed.*

No. 73 Return to an Order of the House of the 19th February, 1917, for a Return shewing if the Canadian Northern Railway Company applied to the Minister of Lands, Forests and Mines to designate the lands or any part of the lands to be granted to the said railway as provided in section 3, 9 Edw. VII., chap. 71. 2. Has the Minister of Lands, Forests and Mines designated any such lands or any part of the same. 3. If such lands or any part of the same have been so designated, what is the total acreage so designated, and of what townships or part of townships does the same consist. 4. Have the said lands or any part of the same been surveyed. 5. If the said lands have not been so designated, why have they not been designated. Presented to the Legislature, March 21st, 1917. Mr. *Davidson. Printed.*

No. 74 Return to an Order of the House of the 23rd February, 1917, for a Return shewing:—1. What amounts have been paid and upon what dates since January 1st, 1916, to the firm of Gunn, Richards and Company, Production Engineers and Public Accountants of 43 Wall Street, 43 Exchange Place, New York, or to any one acting for them, or on their behalf, on account of any

Department of the Government. 2. What amounts, if any, are still owing to the said firm or any one acting for them or on their behalf. 3. What were the services rendered in respect to which such payments were made or liability incurred. 4. By what authority was the employment of the said firm authorized. Presented to the Legislature, March 21st, 1917. Mr. *Richardson. Not Printed.*

No. 75 Return to an Order of the House of the 19th February, 1917, for a Return shewing:—1. The total capital expenditure to the end of the fiscal year for all purposes in respect to the Guelph Prison Farm. 2. Any further capital expenditures contemplated, and if so, to what amount. 3. How many prisoners, on the average, have been accommodated at the Guelph Prison Farm during the year 1916. 4. How many prisoners are now at the Guelph Prison Farm for offences against the criminal law. 5. What was the average number of prisoners at the Guelph Prison Farm during the year 1916 for offences against the criminal law. Presented to the Legislature, March 28th, 1917. Mr. *Ferguson (Kent.) Printed.*

No. 76 Return to an Order of the House of the 28th March, 1917, for a Return shewing:—1. What was the total cost of the knitting plant installed at the Mercer Reformatory, Toronto. 2. From whom was such knitting plant purchased and what was the date of purchase. 3. When was the said knitting plant installed. 4. What amount was paid to operatives up to the 1st of March, 1917, for operating the said plant. 5. What is the value of the goods produced from the knitting plant. 6. Have the goods produced by the said plant been sold, and if so, to whom. Presented to the Legislature, March 29th, 1917. Mr. *Ferguson (Kent.) Not Printed.*

No. 77 Return to an Address to His Honour the Lieutenant-Governor of the 19th February, 1917, praying that he would cause to be laid before this House a Return:—1. Of copies of all correspondence passing between the Government of this Province, or any member, officer or official thereof, and the Government of the Dominion of Canada, or any officer or official thereof, in reference to the care of Returned Soldiers. 2. Of all correspondence passing between the Government of this Province, or any member, officer or official thereof, and the Government of the Dominion of Canada, or any officer or official thereof, in reference to the establishment of Convalescent Homes for the care of Returned Soldiers. 3. Of all correspondence passing between the Government of this Province, or any member, officer or official thereof, and the Government of the Dominion of Canada, or any officer or official thereof, in reference to the relations between the Soldiers' Aid Commission and the Military Hospitals Commission of the Army Medical Service Corps. Presented to the Legislature, April 2nd, 1917. Mr. *Rowell. Not Printed.*

No. 78 Return to an Order of the House of the 21st March, 1917, for a Return of copies: 1. Of all correspondence and documents at any time passing between the Director of Industries, Ontario Reformatory, and the Assistant Provincial Secretary, referring to Alexander McPherson, foreman, Ontario Reformatory Industries, and Fred. W. French, Assistant Director of Ontario Reformatory Industries, or either of them, or relating to any matters arising between the said Alexander McPherson and Fred. W. French. Presented to the Legislature, April 2nd, 1917. Mr. *Richardson*. *Not Printed.*

No. 79 Copies of all Orders-in-Council made under the authority of the Department of Education Act or of the Acts relating to Public Schools, Separate Schools or High Schools, passed since the opening of the present Session of the Legislative Assembly. (*See No.* 61.) Presented to the Legislature, April 2nd, 1917. *Printed.*

No. 80 Return to an Order of the House of the 30th March, 1917, for a Return shewing: 1. What has been the cost of the Ontario Nickel Commission since the 1st day of February, 1917: (*a*) For salaries or payments by way of remuneration or honorarium to each member of the Commission respectively; (*b*) For travelling expenses of each member of the Commission respectively; (*c*) For allowance in lieu of travelling expenses to each member of the Commission respectively; (*d*) For other purposes, specifying such purposes and amounts. 2. What honorarium, remuneration or salary is payable or to be paid to the members of the Commission other than G. T. Holloway. 3. Is the Chairman, G. T. Holloway, still in the Government employ at $20,000 *per* year and $10.00 *per* day in lieu of travelling expenses, and if so when will the obligation of the Government cease. 4. Are the travelling expenses of the said G. T. Holloway from Toronto to Great Britain to be paid by the Government in addition to the allowance made to him. 5. What were the services rendered by each of the following parties in respect of which payments were made to them for salary as shown in the Return of the 16th February, 1916, respectively: Professor George A. Guess, salary, $1,250; F. Clithero, salary, $388.54; G. W. Dixon, salary, $359.03; A. L. Clark, salary, $600.00; R. N. Dickson, salary, $485.00; A. Stanfield, salary, $200.00; E. M. Tozer, salary, $306.60; E. A. Wilson, salary, $210.73. Presented to the Legislature, April 4th, 1917. Mr. *Dewart*. *Not Printed.*

No. 81 Return to an Order of the House of the 19th March, 1917, for a Return of copies of all correspondence between the Government of Ontario or any Member, officer or official thereof, and the Devonshire Race Track Company or any member, officer or official thereof, and in particular the correspondence between J. T. White, Esq., Solicitor to the Department of the Provincial Treasurer, and Hon. Dr. Reaume. Presented to the Legislature, April 4th, 1917. Mr. *Wigle*. *Not Printed.*

No. 82 Return to an Order of the House of the 28th March, 1917, for a Return of:—1. Copies of: (1) Charter of the Gore Bay Riding and Driving Association. (2) Supplementary Letters Patent, dated 17th November, 1915, increasing capital stock to $25,000, and changing name to "Northern Riding and Driving Association." (3) Supplementary Letters Patent, dated 12th February, 1916, increasing capital stock to $200,000. 2. Copies of all annual returns made by the said company. 3. Copies of all correspondence, and documents filed with the Government on the application for the issue of said Supplementary Letters Patent. 4. Copies of application for license to the Provincial Treasurer, and all correspondence and communications in connection with the issue of said license to hold a race meeting at Windsor. Presented to the Legislature, April 6th, 1917. Mr. *Wigle*. *Not Printed.*

No. 83 Report of the Horticultural Experiment Station, Vineland Station, Ontario, 1906-1915. Presented to the Legislature, April 6th, 1917. *Printed.*

No. 84 Report of the Soldiers' Aid Commission of Ontario, 1916. Presented to the Legislature, April 6th, 1917. *Not Printed.*

No. 85 Return to an Order of the House of the 12th March, 1917, for a Return shewing what was the number of prisoners in all gaols, reformatories and prisons in the Province of Ontario, on the thirtieth day of September, 1916. Presented to the Legislature, April 6th, 1917. Mr. *Parliament*. *Not Printed.*

No. 86 Return to an Order of the House of the 26th March, 1917, for a Return shewing:—1. What was the total number of members of the Inside Civil Service of the Government of the Province of Ontario and the total number in each department thereof on the 31st day of July, 1914, the 31st day of July, 1916, and the 28th day of February, 1917, respectively. Presented to the Legislature, April 6th, 1917. Mr. *Elliott*. *Not Printed.*

No. 87 Return to an Order of the House of the 16th March, 1917, for a Return shewing:—1. What tenders were received for each and every of the lots advertised for sale by George W. Lee, Commissioner of the Temiskaming and Northern Ontario Railway in the "North Bay Times" on Thursday, October 12th, 1916. 2. Which of the said lots have been sold by the said George W. Lee, the Temiskaming and Northern Ontario Railway Commission or any officer or official thereof. 3. What were the prices and terms at and upon which each and every of the said lots were sold by the said George W. Lee, the said Commission or any officer or official thereof. 4. Which of the said lots sold by the said George W. Lee, the said Commission, or any officer or official thereof, within the municipalities of Porquis Junc-

tion, Matheson, Cochrane, and Englehart, or what proportion of each and every lot so sold lies within the municipalities. Presented to the Legislature, April 6th, 1917. Mr. *Mageau. Not Printed.*

No. 88 Return to an Order of the House of the 21st March, 1917, for a Return of copies:—1. Of all reports for the year ending October 31st, 1916, of the superintendents of each and all the asylums, government prisons and reformatories in Ontario. 2. Of letters between Assistant Provincial Secretary and Fred Hill, relating to the dismissal of the said Fred Hill from the staff of the Ontario Reformatory at Guelph. Presented to the Legislature, April 6th, 1917. Mr. *Grieve. Not Printed.*

No. 89 Return to an Order of the House of the 16th February, 1917, for a Return shewing:—1. What amount has actually been paid since January 1st, 1916, for war purposes, by the Government, out of the proceeds of the Provincial War Tax. 2. For what particular purposes have such payments been made and what are the date of such payments. Presented to the Legislature, April 6th, 1917. Mr. *Bowman. Not Printed.*

ELEVENTH ANNUAL REPORT

OF THE

Horticultural Societies

OF ONTARIO

FOR THE YEAR

1916

(PUBLISHED BY THE ONTARIO DEPARTMENT OF AGRICULTURE)

PRINTED BY ORDER OF

THE LEGISLATIVE ASSEMBLY OF ONTARIO

TORONTO:
Printed by A. T. WILGRESS, Printer to the King's Most Excellent Majesty
1917

Printed by
WILLIAM BRIGGS
Corner Queen and John Streets
TORONTO

To His Honour Sir John Strathearn Hendrie, C.V.O., a Lieutenant-Colonel in the Militia of Canada, etc., etc., etc.

Lieutenant-Governor of the Province of Ontario.

May it Please Your Honour:

I have the honour to present herewith for your consideration the Report of the Horticultural Societies of Ontario for the year 1916.

Respectfully yours,

W. H. Hearst.

Minister of Agriculture.

Toronto, 1917.

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ANNUAL REPORT

OF

The Horticultural Societies of Ontario

1916

To the Honourable W. H. Hearst, Minister of Agriculture.

SIR,—Herewith I have the honour to present the Eleventh Annual Report of the Horticultural Societies of Ontario, which shows the wonderful increase in membership as well as in the organization of new Societies in the Province. Never before in the history of Ontario has there been such an awakening and earnest endeavour to brighten the home surroundings of the dwellers in cities, towns and hamlets. An outstanding feature is the desire on every hand to further the efforts of all who are interested in increased production, and the utilization of the hundreds of thousands of vacant lots in every urban centre in Ontario. The interest and enthusiasm shown by the delegates at the Convention held in 1916, augurs well for the future development of these splendid educational Institutions. A full and complete report of all the financial transactions of these organizations will be found hereto appended.

Faithfully yours,

J. LOCKIE WILSON,

Superintendent.

OFFICERS, 1917

President ..... Dr. F. E. Bennett, St. Thomas.
First Vice-President ..... Prof. J. W. Crow, O.A.C., Guelph.
Second Vice-President ..... Wm. Hartry, Seaforth.
Secretary and Editor ..... J. Lockie Wilson, Toronto.
Treasurer ..... C. A. Hesson, St. Catharines.
Hon. Director ..... Rev. G. W. Tebbs, Hamilton.

Directors: District No. 1, Rev. A. H. Scott, Perth; 2, Walter T. Ross, Picton; 3, R. Whorley, Haileybury; 4, T. D. Dockray, Toronto; 5, Jas. Ogilvie, Hamilton; 6, J. Grieves, Seaforth; 7, E. E. Kilmer, Brantford; 8, Dr. J. A. Bothwell, Stratford; 9, C. D. Brown, Walkerville.

Auditors: Mrs. R. B. Potts, Hamilton, and Miss Mary Yates, Port Credit.
Representatives to American Civic Association: J. H. Bennett, Barrie; Rev. G. W. Tebbs, Hamilton, and J. Lockie Wilson, Toronto.
Representative to C. N. E.: Dr. F. E. Bennett, St. Thomas.
Representative to Civic Improvement League: R. B. Whyte, Ottawa.
Representative to School Gardens Association of America: C. B. Hamilton, Toronto.
Committee on Names and Varieties: H. J. Moore, Niagara Falls; F. E. Buck, C.E.F., Ottawa; P. H. Mitchell, Toronto; Prof. W. T. Macoun, C.E.F., Ottawa; Wm. Hunt, O.A.C., Guelph; O. J. Robb, Vineland Station; L. Norman, Galt; J. C. Crombie, St. Thomas.

TREASURER'S REPORT

For the Year Ending November 21st, 1916.

Receipts.

Balance on hand as per statement of November, 10th, 1914		$256 76
Affiliation fees on account, 1915-16, and arrears		29 00
Affiliation fees on account, 1916-17		84 00
Bank interest to November 30th, 1915	$1 46	
Bank interest to May 31st, 1916	2 61	
		4 07
		$373 83

Expenditures.

Luncheon for guest at Round Table Talk	$0 40
Honorarium to Secretary	50 00
Caretaker of Convention Hall, 1915	5 00
Services at Convention, 1915	5 00
Stenographer's services, 1915	3 00
Mail and Empire, account advertising	2 48
Thos. Wibby, badges	2 25
A. J. Hersee, rubber stamp	40
Moore, Telford Co., Limited, account	12 70
American Civic Association, fee	5 00
Rev. A. H. Scott, delegate's expenses	25 00
Mrs. Cadwell, delegate's expenses and exchange	25 15
Exchange on cheques (affiliation fees): Ottawa, .15; Chatham, .10; Amherstburg, .15; Sandwich, .15; Galt, .10; Ottawa, .10; St. Thomas, .10	85
Treasurer's account, for postage	1 27
Total expenditure	$138 50
Balance on hand	235 33
	$373 83

C. A. Hesson, *Treasurer.*

St. Catharines, November 21st, 1916.

Audited and found correct,
Mary Yates,
Ada L. Potts,
} *Auditors.*

ONTARIO HORTICULTURAL ASSOCIATION

The Eleventh Annual Convention of the Ontario Horticultural Association was held in the Railway Committee Room, Parliament Buildings, Toronto, on Wednesday and Thursday, November 22nd and 23rd, 1916. When the proceedings were opened by the President, the room was completely filled with delegates from the different sections of the Province.

PRESIDENT'S ADDRESS.

Rev. G. W. Tebbs, Hamilton.

The first decade of the existence of the Ontario Horticultural Association has passed, and at this the eleventh annual gathering of delegates representing 91 Horticultural Societies having a membership of 16,000, I bid you most hearty and cordial greetings.

We are still in the midst of this fearful war, with little to encourage us that the end of it is near. May our next gathering be held with no sound of strife in our ears, but with our loved ones safely back, and with a lasting and permanent peace assured to all the peoples of this beautiful world, upon which we live and move and have our being.

Many of the sons, brothers and husbands of the many members of our Association are to-day at the front fighting for us, and our fair homes. Others alas! have laid down their lives, making the supreme sacrifice for us, and I am sure that it is the wish of all our officers and delegates assembled here, that I should voice on behalf of this Convention our earnest wish for a speedy and safe return of the living; and to assure those bereaved of their dear ones of the deepest sympathy of all assembled here to-day.

On the same fields one hundred years ago, brave men fought and bled for the liberties of Europe; the same earth was watered with the tears of dying men; it was fertilized with the blood of the best of heroes as is being repeated to-day. Ploughed with shot, and harrowed with shell then as now, travellers tell us that every springtime those fields are covered with blue forget-me-nots. When Keats, walking in his garden, saw all the ground beneath the rose bushes covered with pink petals he exclaimed, "Next year the roses should be very red." When Aeneas tore the bough from the myrtle tree, Virgil says the tree exuded blood. This is only the poet's way of saying that civilization is a tree that is nourished, not by rain and snow, but by the tears and blood of the patriots and prophets of yesterday.

The science of Horticulture—I had almost said the art of Horticulture—has always emphasized the truth of the illustration I have used. I mean, the work that you have been doing, and are doing is only the emphasizing of the principle of vicarious service and suffering. This is the first lesson which this world war teaches me, a flower lover.

Your labours and your toils for the making of beautiful homes, communities, towns and cities, has been at the cost of the consecrated energy of the Horticultural workers of the Province through the year that is past, blood and strength that you have given willingly, sometimes appreciated and sometimes not, by those whom you have tried to help and interest in the work of building up the beautiful.

But the wine costs the clusters; the linen costs the flax; the furniture costs the forests. Astronomers tell us that the sun makes our gardens beautiful at the cost of burning itself up. Each golden sheaf, each orange bough, each cluster of grapes, costs the sun thousands of tons of carbon. Geikie, the geologist, shows us that the valleys grow rich and deep with soil through the mountains growing bare and being denuded of their treasure. Beholding the valleys of France, and the plains of Italy, all gilded with corn and fragrant with deep grasses, where the violets and buttercups wave and toss in the summer airs, travellers often forget that the beauty of the plains was bought by the bareness of the mountains. Faraday amazes us by his statement of the energy required to embroider a violet or to produce a strawberry.

To untwist the sunbeam and extract the rich strawberry red, to refine the sugar and to mix its flavor, represents heat sufficient to run an engine from Toronto to Detroit. Thus nature works, silently, noiselessly, without fuss, without advertisement, but with tremendous energy and great expenditure. As her humble students, we flower lovers must not forget the lesson.

I am sure that in some measure this has been the character of the tasks you have undertaken in this fair Province of Ontario.

You have been labouring in partnership with, nay in love with nature as she has appealed to you in her beautiful, if at times wayward, moods. You have been trying to make others appreciate her too, in your efforts to make your home town surroundings lovely by introducing her to your neighbours, but at much cost of your time, thought and treasure.

I trust that as we meet here once again we may each of us gain renewed inspiration and fresh invigoration to carry back to the other workers the messages this Convention bears, and from the programme before us, I am certain we shall not be disappointed.

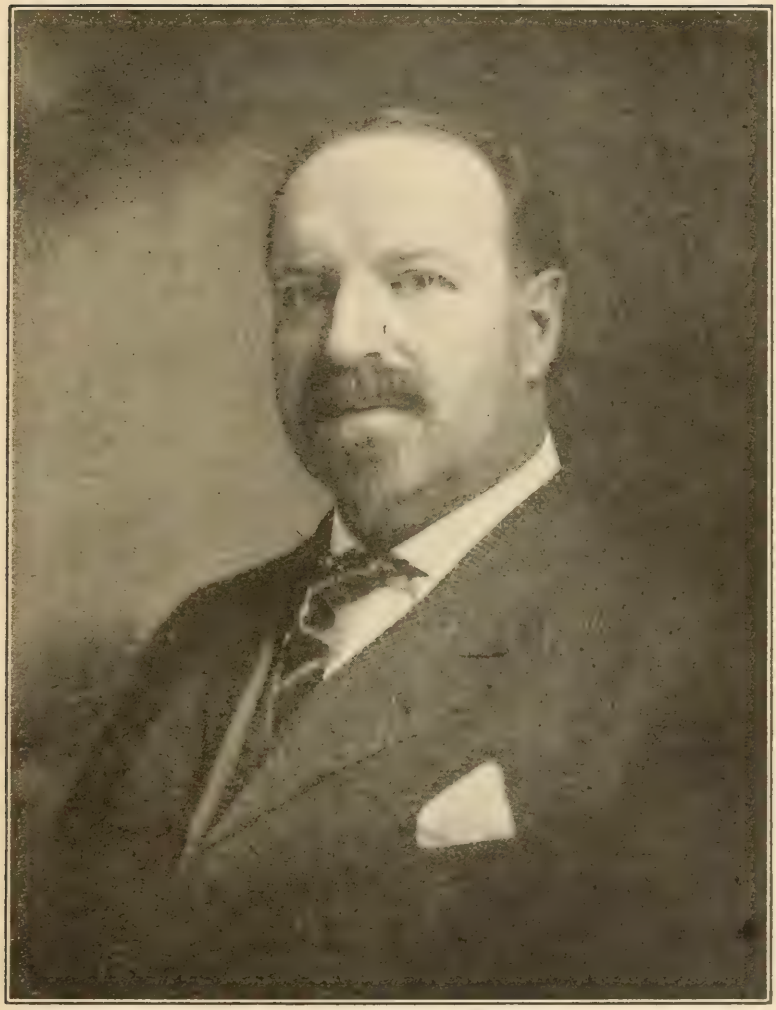
Just one other lesson which we as garden lovers may learn from the events of these sad and bitter days. It is the value of having a big vision of our task.

The late Earl Kitchener had his plans matured for a much longer and more strenuous campaign than most men of the nation thought possible. Yet events to-day are proving his estimate of the duration of the war, to have been correct and even conservative. The war will only be decided by "a long, long, long, and a strong, strong, strong pull" on every side with every man at his post doing "his bit," with plans of campaign fully matured, and set in motion. There must be loyal co-operation of every branch of the Army and Navy. Each of the Allies must unite in the common cause, and then, and only then, will final victory be attained. The man on the street in England, to-day, says, "O, of course we shall win. It will take a bit of doing, but—we shall win." And he represents the Empire in its resolve. Fellow members of the Horticultural Societies of Ontario, we have a big task ahead of us.

Hitherto our vision has been largely confined to our own lovely little lawns, and our own charming little gardens. Their beauty has often been magnified because it was our own doing, and was good in our sight.

In a very literal sense we have made a frontal attack upon the ugly and unsightly, but only on a small section of the whole battleline.

The larger vision is now possessing us. Town and city improvement schemes, town planning, park surveys, town and city approaches are calling for our help; the joining up of our Horticultural work with allied societies, loyal co-operation with other agencies having the same ends in view, and with similar aims to our own, the



Dr. F. E. Bennett, President.

making of the Province more productive and more beautiful. Production, patriotism and perfection is the battle-cry of Horticulture at this time, and we have still a long way to go. We have not yet done all we could with our waste spaces, which, with their weeds, like the poor, are ever with us. The planting of trees in our towns, beautifying our streets, is a species of re-afforestation which may well engage our attention. The production of new and improved varieties of flora especially suitable to the very varied climate found in the different parts of our Province should have place in our programme. The education of the rising generation to love the flowers, plants and trees we love, is calling for our best efforts. Conservation, co-operation, and concentration in every branch of Horticulture must play a large and important part in the unfulfilled task lying before us. Are we equal to the larger vision? I believe we are. Of course it is going to take time to bring all this to a successful issue. But everything that is worth while takes time. Time is a very negligible quantity in the plans of our generals to-day. You gardeners know that which ripens quickest is of the least worth. The mushroom only needs a night; the moss only asks a week to cover the fallen tree; the humble vegetable asks a few weeks of summer weather, and the strawberry but a month or two at most; but planting his apple tree, the gardener must wait years for his ripened russet, and the forester many years for a full grown oak or elm. Were it given to the child tearing open the golden meat of the orange, to trace the ascent of the tree, he would see the wild bitter orange growing on the edge of the wilderness. But your horticultural ancestors, standing by the fruit, grafted it for sweetness, pruned it for the juicy flow, and nourished it for taste and colour. Could he who picks the peach or the pear, have this inner vision, he would behold an untold company of husbandmen standing beneath the branches pointing to their own special contribution towards the excellence of the whole, and indeed amongst them he could see flower and fruit lovers from this Association. R. B. Whyte, near the raspberries; A. Groff amongst the gladioli, Professors Macoun and Crow hybridizing and perfecting new varieties, two ladies, Misses Yates and Blacklock amongst the perennials, perfecting colour schemes, and a Doctor Clarke tickling Mother Earth with his tulips.

We have been long enough doing the ordinary routine work. Let us get out of the ruts, for some have become so deep that they have almost become graves. There is no time to occupy our attention with out-of-date methods of work. We do not exist simply to help, and get glory for ourselves. If we do, there is a grave danger that we shall be buried beneath the weight of our own self-gratification, and we shall be most indecently interred at that. I have no doubt, but that the report of our indefatigable secretary will show that happily there are not many such Societies in this Province, and that in spite of all the distractions created by the war, horticulture in the Province of Ontario has made excellent progress during the year.

Your Board of Directors is ready at all times to take into consideration everything that will conduce to the well-being of each and every Society. For this it exists, and hence it is most important that every Society in this Province should be represented at these Conventions, not only to elect capable men on the Board to deal with matters in general, but to discuss at the Conventions the matters which local societies feel should be dealt with.

The Province is yet young. We have by no means exhausted the possibilities, horticulturally, of which this Province is capable. We have hitherto been satisfied to accept seeds, bulbs and plants from either the United States or from overseas.

The problems of the production of our own seeds and bulbs is becoming increasingly important. At the same time we recognize with gratitude the labours of an army of workers in Horticulture the wide world over. There is a great need of specialization of particular plants and flowers and fruits in Canada. In some degree this has been accomplished in roses. Barley and oats used by the farmers of Ontario were originated, after careful experiments, at the O. A. C., and with remarkable success. I would respectfully suggest that the authorities at our Provincial Farm give a little larger place to the Horticultural section of their work, beyond the actual amount of work done in the interests solely of the student body of the College.

I am quite sure that a little more money spent there on hybridization and propagation in the Horticultural Department, would be of the greatest value to the Province at large.

I must not allow another moment to pass without, on behalf of the Horticultural Societies of the Province, expressing to the Government our deep sense of the loss the Province has sustained in the deaths of two warm friends of this organization. I refer to the Hon. C. C. James, earlier in the year, and more recently, the Hon. Mr. Duff, Minister of Agriculture. Both these gentlemen have graced our Conventions with their presence, and kindly words of counsel, and with the more practical assistance in their official duties elsewhere.

In closing, I wish to thank you most sincerely for the honor you conferred upon me last year, in unanimously electing me as your President, and I bespeak for my successor in office, the same kind consideration which you have afforded me.

We are here as flower lovers. Let us apply ourselves to the task in hand, and then go back to our Societies fully determined to make them better than ever.

You are weaving, day by day,
Beauty for the sun to slay,
The fleeting pageant of delight
That dwells within a garden bright.
You this Persian carpet spread,
And named it a Sweet-William bed,
You painted this great lambent screen
Of Larkspur, lilied white between.
You hang vine garlands, low and high,
Ripe for Bacchus, reeling by,
You are the over-lord of grapes
And plums, and all alluring shapes
To win the eye and tempt the tongue,
Globed liquid honey, leaves among.
Living, you, an earth-born guest,
Are of men the mightiest;
And when you die, earth-lover,
Flowers shall be your cover.

C. A. Hesson: In presenting the Treasurer's report, I wish to congratulate your Association, not necessarily on the balance which you are enabled to show this year, but more particularly on this fact that comes out, that the number of Societies which are affiliated with this Association, is on the increase; in fact, there are very few Societies in the Province to-day which have not been at some time affiliated with us. A few years ago the question arose as to what would be the best method to adopt whereby all Societies might be induced to affiliate with us, looking of course to the enlargement of our area of action, and bring us more closely in touch with the individual Horticultural Societies. I am glad to congratulate the Association on the fact that there are now not many Societies which have not affiliated with this Association; but I am sorry to say that there are some

A magnificent Purple Beech with foliage 75 feet in diameter.

Societies which have affiliated, which are not living up to that affiliation, namely continuing with the Association. You will remember that last year an effort was made to bring the Societies more closely in touch with this point, by the introduction of delegate's cards. I find that these cards are working efficiently, except in so far that some doubt seems to be in the minds of the Secretaries of the Horticultural Societies as to what report or what membership the annual fee to this Association is based on. It is based upon the membership reported for the previous year, that is, not the current year—the membership which is contained in the annual report. This is because the reports of the current year are not all received at the time of our convention. Some of them are delayed, and of course we cannot compel them to come in until a later date; so that we have to depend upon the published report of the previous year, on which to base our membership fee report.

J. Lockie Wilson: I listened with a great deal of pleasure to the report of our Treasurer, Mr. Hesson, who is a business man, and who has done a great deal for us. This Central Association is of vital importance to the well being of the local societies. You will notice that each year we are adding to the sum of our new Societies, and the more Societies they are organizing, the smaller of course your grants will be, and it is up to the Central Association to see that the Legislature keeps enlarging the grants, so that the individual grants may not become lessened, so that each Society in this Province should become affiliated with the Central Association. It is a small fee. And we surely want to keep the home fires burning, and keep the flowers and vines in shape until our boys come home, because it would not do to have our soldier lads return to their home villages and find that we had neglected to keep things pleasant and bright for their return. I know when they come home they will find those at home have done their part to keep things bright and pleasant.

The Treasurer's Report as given on page 6 was then adopted.

REPORT OF SUPERINTENDENT.

J. Lockie Wilson, Toronto.

Amid the distractions of the world conflict, and the many requirements for Patriotic and Red Cross purposes, urgent appeals for the war-cursed people in lands beyond the seas, and the awful heartache of families who have lost their loved ones in their gallant fight in order that freedom and justice might not perish from the earth, one might have expected that the zeal of our earnest workers would have somewhat abated. We know, however, that this is not the case, as shown by the fact that Societies have not only done better work than ever before, but many of them have largely increased their membership, and extended their line of laudable endeavor. Florists and seedsmen unite in declaring that there is to-day a far larger percentage of people engaged in the culture of gardens than ever before, and the work is conducted happily along artistic and constructive lines. In hearts which cherish flowers, as in those which swell to music, evil thoughts are not apt to find a lodgment. In gardens through all the ages the sons of men have found rest and their nearest approach to happiness. There are few to-day, who do not desire to do some gardening work. What enhances home environment more than perennial flowers and shrubbery, with beauteous annuals which respond readily to cultivation? The returns which gardening holds forth in health, home improvement and

happiness present unanswerable arguments to those who still refrain from taking part in this joyous and healthful employment. Year by year the number of Societies in Ontario is increasing. In 1916 seven new Societies were organized, and several more will hold their first annual meetings during the second week of January. Up to date we have in good standing 84 Societies, with an enthusiastic membership of 16,000, and the slogan of each is for a more beautiful Ontario. Just think for a moment what this great army, each one doing his part, can accomplish in the years to come. Smoother lawns, cleaner backyards, and more vines clinging lovingly on the walls of flower-decked homes.

Consciously or unconsciously, we are fascinated and delighted by impressions received from all those things, which by their harmonious variations of form and color command our attention. Beauty, it is said, is the visible presentation of truth. Flowers, trees and parks speak a powerful and impressive language, and give life to noble thought and elevating sentiments, which tend to lift us out of the ordinary turmoil of daily routine, and put us into a state of mind that gives us a clearer view of man's destiny here on earth, and a proper appreciation of beauty leads humanity to a higher life. Deep in the soul of every one of us is implanted to a greater or less degree an irrepressible craving for the scenic beauty of the landscape as well as the living beauty of beast and bird.

Parks and Boulevards.

The smallest town and village should have its park and playgrounds and, if possible, a municipal greenhouse and nursery for the furnishing of trees, plants, and shrubs to be utilized in decorating public squares and municipal and school buildings and grounds. Ornamental streets and boulevards equipped with trees, plants and flowers are not a luxury, but a necessity in advancing the general happiness of citizens.

An eminent landscape architect states: "The average person guilelessly believes that parks are more for ornament than use, and, therefore, that the first consideration should be of art rather than utility. The artistic development of a park, however, cannot be stable unless based upon recognition of the fundamental principle, utility."

Parks are not only for recreation of the mind, but to promote health and comfort of the body. Recreation for all the people, adults as well as children is absolutely necessary for the greatest development of mind and body. The City of Ottawa has done excellent work along the different lines of civic improvement, and its driveways are rapidly becoming things of beauty, and will, doubtless, prove a joy for ever to its citizens of the future. I congratulate the Ottawa Horticultural Society on the excellent work it is accomplishing, and on the magnificent Year Book issued by them in 1916, which is a most valuable guide for the improvement of lawns and gardens. This book was compiled by Messrs. R. B. Whyte, W. T. Macoun, F. E. Buck, and J. B. Spencer, and reflects great credit on the committee in charge.

A number of flower shows were held, the Rose Show at St. Catharines exceeding in beauty those of previous years. The St. Thomas Tulip Show was also a marked success.

Speakers have been sent out to a number of Societies.

We have received from Sir Edmund Osler a courteous invitation to visit his beautiful conservatories some time during the Convention, and I am sure that every delegate will accept Sir Edmund's invitation.

Saddened were our hearts when the announcement was made of the death of one of our kindest and best members; John Cavers has ceased from his labour, but the work he has done for the Ontario Horticultural Association will never die. We sincerely mourn his irreparable loss, and his widow and family have our loving sympathy.

"If a star were quenched on high,
For ages would the light
Still travelling from the sky
Shine on our mortal sight.
So, when a good man dies,
For years beyond our ken
The light he leaves behind him lies
Along the path of men."

School Gardens.

School garden work has not progressed so rapidly in Ontario as some ardent advocates of this proposition desire. This lack of advancement is due largely to the fact that qualified practical instructors in this subject are difficult to secure. It certainly is a most important part of the education of the child. Garden work should not, however, be considered as an end in itself, but rather as a means to an end. It is not the intrnsic value of the plants, flowers, and vegetables that makes the school garden so important, nor the knowledge acquired of plants and their surroundings; it is both of these and the training of the powers of the child. Most pupils are interested in gardening. It is a subject on which they can concentrate their attention quickly, and when brought into proper relation with other subjects taught in the school, it becomes an aid in teaching these. By concentrating the attention of the pupil, it lessens the time necessary to acquire a knowledge of them. It has been found by experience that even two hours a day devoted to manual training or domestic art, enables the pupils to accomplish more in the remaining time than they formerly managed to perform in the whole time spent in school.

Vacant Lot Gardening.

Much good work is being done in the different towns and cities of Ontario in vacant lot gardening work. In Toronto alone there are 2,700 acres of vacant lots where once productive gardens smiled. But, sad to relate, even the smile that adorned the faces of real estate promoters has vanished like the dew on the noxious and persistent bindweed that now flourishes unchecked where healthful vegetables were wont to grow. The Vacant Lot Gardening and the Rotary Clubs have both done excellent work and arranged for the cultivation and care of 350 lots during 1916. The report of the good work done by these clubs makes interesting reading and the value of the vegetables raised on these lots was several thousand dollars. When you consider that there are still over 20,000 lots to be cultivated, a slight idea can be had of what remains to be done in this connection. Many returned wounded soldiers last summer found healthful employment in caring for some of these vacant lots. The Vacant Lot Gardening and the Rotary Clubs which have done such good work in Toronto have decided to work in unison and a joint committee has been formed for that purpose.

In France and Flanders high value is placed on every foot of tillable land. More particularly is this the case at the present time when so much of the tillable

soil is unavailable, being occupied by the millions of opposing forces. Humanity cannot live without necessary food to sustain the body, and, hence, the land is tilled right up to the firing line by the women, both old and young, in these lands.

The Smoke Nuisance.

A movement has been on foot for several years in the larger cities of the United States and Canada in an endeavor to abate the smoke nuisance, which has a tendency to injure the health of people as well as the flowers which they endeavor to grow. Some of the municipal councils have enacted by-laws in their efforts to minimize the nuisance, but in many cases they have not been as strictly enforced as they should have been. It is to be hoped that in the not

Wild Columbine and Ferns on grounds of W. A. Child, M.A., Hamilton.

distant future, the dwellers in the cities will not be obliged to breathe air polluted by the foul smoke that belches forth from the ten thousand smokestacks in the cities of this land.

I cannot close my report without making reference to one whom we all held in respect and esteem.

I am sure that the hearts of the members of our Association are filled with grief and sorrow for the widow and family of the late lamented Minister of Agriculture. Mr. Duff's sudden death coming as it did so soon after the news was flashed across the ocean that his valiant son, Clark Duff, had made the supreme sacrifice in the cause of freedom, deepens our heartfelt sympathy. I am sure we all sincerely regret the passing of our kind and genial Minister of Agriculture.

I wish to thank the officers, directors and members of our Association for the splendid work they have accomplished in this trying and eventful year.

REPORTS OF SOCIETIES.

AMHERSTBURG: This Society has maintained all the town beds in good condition during the year, added largely to its stock of shrubs and has lately received direct from Holland a variety of bulbs of great merit which are planted in the town beds and given to members.

BELLEVILLE: Distributed seeds, plants and bulbs to school children and members and planted public parks.

BRAMPTON: Membership increased by 25. This Society was instrumental in inaugurating a "Clean-up and Paint-up" campaign early in the season which was well taken up by the citizens and resulted in good work being accomplished. Several hundred plants and cannas planted in public places, which helped to beautify them. This work will be extended in 1917.

BRANTFORD: The season of 1916 has been the most successful in the history of the Brantford Horticultural Society, the membership being 521, nearly double that of any other season.

The Society imported 28,000 bulbs from Holland, nearly a thousand rose bushes from England and has purchased a hundred dollars' worth of shrubs, etc., from Canadian nurseries, besides twenty-five dollars' worth of garden books and horticultural magazines.

The sum of $187 was distributed in prizes for lawns, gardens and window boxes.

This Society is aiming at a membership of one thousand for the season of 1917.

CARLETON PLACE: Last fall, bulbs, and in the spring, vegetable and flower seeds were distributed to every pupil in the Public Schools. The School Board supplied the schools with attractive window boxes. Grounds of Town Hall improved by planting of shrubs and a start has also been made in the Park, nearly all the labor being voluntary. Citizens stimulated to beautify and improve their premises. With regard to the work among the children, the Principal of the Public School says: "I found the pupils more interested than ever before. It was simply marvellous how many portions of backyards were turned into beauty spots by the boys and girls." Owing to unfavorable weather conditions, no flower show was held. Membership increased by 41.

CAYUGA: The work of the Cayuga Horticultural Society for the year 1915-16 has been almost wholly confined to tree planting about the town. A number of streets were chosen by the Society early in the spring, and a survey was made with regard to the number of trees required and the wish of the people in front of whose places the trees were to be planted. In all, 170 trees were planted under the direction of the Society, nearly all of which started to grow, but the extremely adverse season that followed has destroyed many of them. These will be replaced at a very small charge by arrangement with the nurserymen.

In addition to this, different classes of horticultural goods were supplied to the members at club rates, nearly all of whom availed themselves of the opportunity to get horticultural goods at reduced prices.

No premiums were given to the members this year as it was thought the funds could be used to better advantage for civic improvement.

The plan of work outlined in the spring also covered the grading of boulevards and the beautification of waste places in the centre of the town. It was found, however, impossible to carry this out in 1916. Considerable work was

Home of Mrs. C. W. Cadwell, Windsor, showing what can be done on hard clay soil in one year.

done, however, in the beautification of the cemetery which step was taken in co-operation with the local Women's Institute and was much appreciated by all interested.

CHESTERVILLE: Membership increased. Replaced trees planted last year which were winter-killed, and assisted the High School Board in planting 30 trees in their school grounds. Distributed plants and bulbs to members. Killarney roses gave great satisfaction as they bloomed from early summer to October.

CLINTON: Increase in membership. Plans have been drawn up to further beautify the already beautiful town during 1917.

DUNDAS: Gave seeds to school children to raise flowers for the annual exhibition, but this had to be cancelled on account of drought. Boys were given prizes for bird houses, some of which were splendidly made, and girls received awards for knitting, some of this being really expert. These prizes were given in connection with the school sports. In the spring, members received options and trees and shrubs were also sold to those who wished to purchase. Lectures held during the winter. Flower beds planted in park and this work will be extended to the boulevards and streets in 1917.

DURHAM: Owing to war conditions nothing new was attempted. Distributed shrubs, plants, seeds and bulbs to members.

ELMIRA: Owing to the dry weather, work was carried on under difficulties. Flower beds were planted around the town and a public meeting held which was addressed by Prof. Crow. The flower show was good for such an unfavorable season. Membership slightly decreased.

ELORA AND SALEM: Membership 86 as compared with 55. Work of the year was divided into four classes. (1) Children's gardens with three grades of same; each being given seeds and plants according to their ability to grow them in a garden 6 x 10 feet. Gardens were judged twice on a basis of 40 per cent for laying out, 40 per cent. for cultivation and 20 per cent. for growth. Nearly 70 gardens were entered. There was an exhibition of children's products. (2) Exhibition of flowers, fruits, vegetables and plants and also lawn and garden competitions. (3) Civic improvement, by putting in flower bed in front of Town Hall. (4) Distribution and importation of plants and bulbs. Considering that this is a new Society in a village of 1,200 people, mostly working men, the results and interest shown are very encouraging.

FORT WILLIAM: The cultivation of vacant lots was again undertaken and large crops of vegetables were raised by the workers.

The Parks Board gave prizes for a garden competition, which was taken up by the public and the competition was keen.

The Board of Education distributed flower and vegetable seeds to the school children, offering prizes among the different schools for the best kept school children's garden. The Society held a bulb show in March.

The Fall Flower Show was the best yet, the exhibits being of a better quality. Sweet Peas were in a class by themselves, and of a superior quality to any that were shown before. Mr. Geo. H. Coo, Secretary-Treasurer of the Board of Education, offered a special prize for a collection of Sweet Peas for school children, which was keenly competed for.

During the evening of the show there were addresses on Horticulture by Mr. J. R. Lumby and Mr. W. A. Dowler, both enthusiastic members of the Society.

Under the trying circumstances of the times great credit is due to our President, Mr. Paul Vanderkaa, for his untiring efforts to keep the Society going.

GALT: The number of members for 1916 is 255 as compared with 221 last year. The Society has maintained eight flower beds in various parts of the city—an increase of one over last year.

The School Gardens Competition has been continued with very good results, considering the season. This year for the first time a nominal charge was made for the seeds, yet the number of plots entered was larger than ever.

We have endeavored further to encourage the amateur by establishing at our show this year separate classes for them in our prize lists.

We regret to report that we are about to lose our efficient secretary, that veteran horticulturist, Mr. R. S. Hood, who is removing to the West.

GRIMSBY: Furnished the *Horticulturist* to their members, also Hybrid Tea Roses, Lilies and Iris. Held a very successful June Rose and Pæony show, with other flowers in season.

GUELPH: Membership grown from 170 to 243, largely through the extra values given in a revised premium list. Some of the options given with membership at $1 are worth at retail prices from $2.50 to $3. Lawn and Flower Garden Competition carried on in each of the various wards of the city, and Vegetable Garden Competition, open to the entire city. Cash prizes awarded in both these competitions. Diploma offered for the best lawn and flower garden, also for the best vegetable garden in the city, open to members only.

The Society again provided window boxes for the city's public buildings, including City Hall, Fire Hall, Post Office and Public Library. This is an excellent object lesson work.

A most successful and enthusiastic meeting was held on March 30th, and was largely attended. Excellent addresses were given by Miss Mary Yates, of Port Credit, on "Flowers for the Home," and by Mr. S. C. Johnston, Department of Agriculture, on "Vegetables and Vegetable Gardening."

The Society delegated the President, Mr. R. E. Nelson, to attend the Tulip Show at St. Thomas, May 11th, 12th and 13th. In addition to President Nelson, several other Directors and members were in attendance, and all were highly delighted with the excellent and most commendable work done by the St. Thomas Society.

HAILEYBURY: Membership has increased from 97 to 111. In spite of the unfavorable weather in the early part of the summer the annual show was distinctly good, and the exhibits though perhaps not quite up to the mark of former years were numerous and in many instances the competition was keen. Held several small meetings of the members through the summer at which interesting discussions took place. Mrs. Potts, of Hamilton, gave a very interesting talk on "Rose Growing," which was very much appreciated. A new departure was a competition organized amongst the children of the schools, thirty children entered plots for competition, and the results achieved were very good. The garden that won the first prize was especially fine; it would have seemed almost impossible that a young girl could have raised such perfect specimens of plants.

HAMILTON: Membership for 1915-16, 526; for 1914-15, 457; increase over preceding year 69; number of lectures, 4; garden meetings, 16.

Garden meetings are found to be very popular. This year a change was made, and its success means the more complete undertaking of the plan next

season. While the visits to large gardens, like that of Mr. Alexander, who opened his grounds each Wednesday in June, were enjoyed by the members, it was found that visits to ordinary city-lot gardens, which showed marked individuality, or some special features to be studied, led the members to consider possibilities and varieties not realized before. Garden visiting was well sustained, and plans are being developed for more of this next season. In May, a trip was made to Grimsby to visit Dr. Clark's splendid tulip garden; the value of this privilege cannot be estimated, but results are expected to be manifested next spring.

Waterfall in Mr. Child's grounds, Hamilton.

The success of the small bird-house exhibit and sale at the March meeting last year, led to the planning for a series of Garden Arts and Crafts Exhibitions, though only one was staged, the others being withdrawn because of conditions beyond the control of the directors. The one staged, that of "The Bird House Section" by the boys of the Manual Training Classes of the West End School division was a great success, with over 200 entries, and the boys of one school sold

their boxes, making thus about $50 for the Red Cross Funds. Bird protection will be undertaken on a larger scale next year.

The Boy Scout Garden Competition, in which some seven troops were to have entered, to qualify for their gardener's badges, was withdrawn for this year in order that the boys might engage in fruit picking for the soldiers. As fire destroyed the Scout's headquarters, including their library, a set of garden books was donated by the Board for reference to assist these future horticulturists.

The Garden Competition for members (Officers and Directors being barred) was a much greater success than anticipated, considering the conditions prevailing. The prize winners were given plants and bulbs, though provision had to be made to meet special features not on the schedule, and extras also had to be arranged for, owing to the close competition and many were recommended for good results. Hamilton is a rose-growing city, and the extension of this line was so apparent, that, in view of the questions asked, it was deemed advisable to submit a list of fundamental questions to the successful growers, and when the answers are in, these will be compiled and the results printed, thus making very practical literature available for any members who desire its aid.

The Community Clubs, which were adopted by the Society, have continued to receive such help as they required, and have just closed the most successful year they have had. The judges sent from our Society found marked improvement along all lines. The children had a part in the garden competition undertaken, so the surplus plants from the downtown gardens did good service in the community beds. Twenty-three adult prizes were awarded, and four children's, for improvement in home grounds.

The Mountain Sanatorium, asking for help to establish beds and borders, has opened up a new field for activities, and as the value of gardening as one of the helps in curing ailments is recognized, the appeal will not be in vain. The surplus plants this year will be applied to this work, and a beginning made as soon as possible.

The attendance at lectures is increasing steadily, and a splendid course of these was arranged, the members showing their interest by taking part in discussions, and asking questions with a freedom more noticeable than in the past.

Considering the fact that conditions in this country are not normal, the year can be looked upon as a successful one in many ways, and the workers look hopefully forward toward the coming one.

Spring Premiums.—Dahlias, Lilies and Herbaceous perennials (five selections).

Fall Premiums.—Tulips, Narcissi and Pæonies.

High Park: Inaugurated a Winter Bulb Show in March for bulbs grown in pots by members, which was a decided success and will be continued. At the Summer Flower Shows the exhibits were sold by auction and the proceeds, $30 donated to the Red Cross Fund. With the hearty co-operation of Park Commissioner Chambers, improvements to the Bloor and College Street entrances to High Park and surroundings and sodding and planting of a circle on Indian Trail were carried out. It is also intended to convert an unsightly lot adjoining the library into a beauty spot. Membership largely increased. The following new score adopted for judging garden competitions proved very satisfactory:

Class A—Flower garden and grass plot.
Class B—Flower, vegetable garden and grass plot.

	Class A.	Class B.
Front lawn and general appearance	15 points	15 points
Back lawn	20 "	20 "
Shrubs (including rose bushes)	10 "	5 "
Vines, annual creepers included)	10 "	5 "
Annuals	10 "	5 "
Perennials	10 "	5 "
Hedges or fences (including decorated board fences)	10 "	5 "
Vegetables	..	25 "
General arrangement and effect	15 "	15 "

HANOVER: More civic improvement than ever before carried on. Window boxes placed in Library, Town Hall, banks and furniture factory. Boston Ivy planted around school buildings, and also flower beds and caring for one in front of Post Office. Held flower show and bulb competition March 31st and April 1st, at which rural schools were allowed to compete, which resulted in a much greater exhibit. Membership increased by 41. There was also a lawn and garden competition open to all except business and professional men. Prize was 100 tulip bulbs.

KINGSTON: No exhibition held on account of weather and war conditions. Directors intend holding lectures and demonstrations during the winter and spring to interest members. Work done during the year consisted in beautifying public parks, boulevards and playgrounds, and much has been accomplished at a minimum expense to the Society. Expect a large increase in membership in 1917.

KINGSVILLE: During the past year 28 beds were put in to beautify the plots on the town boulevards and street corners.

Membership increased. Spent $319 on planting bulbs and other civic improvements.

The Society has expended already for Tulips for the town between $80 and $90 for the fall planting, has put out 35 beds of Tulips in the town, and besides that, the people in the town are spending about $125 on their private beds. In other words, the Society and its members have planted 16,500 Tulip and Hyacinth bulbs this fall. We are trying to double our membership for the coming year.

We expect, if our Tulips turn out well, to have a Spring Flower Show, similar to that one held at St. Thomas last May, only, of course, on a smaller scale.

KITCHENER: Membership increased from 266 to 318. Premium list extended, of which greater advantage was taken by members. No outdoor competition held on account of drought and short supply of city water. Entertained members of the Canadian Horticultural Society during their sessions in August. Mr. Geo. Baldwin, Toronto, gave an excellent address on "Home Gardens." The annual exhibition was a success in every respect, the school children making a most creditable showing. Gardens of the children were judged and awards made. Good work was done and the advice given by the Society as to growing of plants and vegetables is having a good effect. This is the best line of work, for the future citizens are educated in producing good vegetables, and this will benefit the Society in years to come.

LINDSAY: Two years ago this Society had about 75 members, last year, 147, and this fall the membership will reach nearly 300. Interest in Horticulture is growing very fast and the prospects for the Society in Lindsay are splendid. The Society has the support of the Town and County Council, which give grants to assist in the buying of bulbs, plants, etc. The railways have promised to do

their part in beautifying the station grounds. Flower beds were placed in some of the parks and other public places. In the spring each member received two Rose bushes and ten Gladioli, and in the fall, five Hyacinths, five Narcissi, twelve Tulips and the *Horticulturist,* or Freesias and Roman Hyacinths in lieu of the journal.

LISTOWEL: The total number of paid-up members for 1916 is 87. This being the first year of its existence, the work entered upon by the Society has necessarily been to some extent of an organizing and educative nature. A booklet was issued early in the season setting forth the aims and objects of the Society, also including a list of free options in seeds, bulbs, plants, shrubs, gardening hand-books, etc., of which many of the members took advantage.

Cannas and Caladiums on a Seaforth lawn.

A Tulip Show was held on Empire Day, when two windows of a store were filled by a very creditable display of single and double Tulips, Hyacinths and Pansies. Prize ribbons were awarded the successful competitors.

A start was made by the Society in the direction of town beautifying. The grounds at the Government Building and Public Library were laid out with perennial borders and flower beds. Other beds of flowers were planted at the intersections of some of the town streets. Considerable improvement was made at the school grounds and park at the pumping station.

A larger scheme of park and street beautifying was proposed by the Society, and Mr. Tomlinson, landscape gardening expert, of the Ontario Agricultural College, Guelph, visited this town, and gave the Society some valuable suggestions.

Owing to the unusually dry summer the flowers in the Society's plots, as well as in private grounds, did not turn out as well as hoped for, consequently the Society did not hold a summer floral exhibition.

A large consignment of bulbs has arrived from Holland for planting in the Society's beds and for beautifying the home surroundings of the members, which gives promise of a fine show of bloom in the spring and a still greater interest next season in this most pleasing branch of Horticulture.

MARKDALE: Slight decrease in membership. Annual flower show was not held this year owing to the fact that the season was not at all favorable for the production of good flowers. Regular premium list issued to members which consisted of a selection of plants, bulbs, annuals, etc.

The Society is taking up a new line of work this fall, the distribution of bulbs for winter and spring flowering to interest our members in bulb culture. This will be a splendid means of beautifying the town early in the spring and will also help to advertise the Society.

MIDLAND: The Midland Horticultural Society during the past year has distributed to its members and school children, plants, seeds, bulbs, etc., to the value of $123. This includes $25 for three large beds of flowers, two at the New Library and one at the Town Hall. Thirteen hundred packets of seeds were given to the school children, as it was intended to hold a Flower Show as last year. Unfortunately, owing to the unfavorable season the children had no success with their flowers, so no show was held. Membership increased a little.

MILTON: Had a successful year; plants, shrubs and flowers were given to the members. A prize was given for the best display of Tulips; a pleasing feature of their work was a lawn and flower competition. Held a successful flower and fruit show in September. Planted a Tulip bed at the Post Office.

MITCHELL: There has been progress both in membership and in lines of work undertaken. Besides caring for the flower beds around the Carnegie Library, also at the Post Office, this year in the spring, each child in the Public School over ten was given a package of the best Aster seeds obtainable, with the object of planting them and exhibiting at the Fall Fair. It proved a wonderful success, no less than 75 beautiful bouquets being on exhibition; besides three money prizes, each of these children received, this fall, an assortment of Tulips, Crocuses and Hyacinths for planting now. This work has spurred the School Trustees to purchase and plant over 1,000 bulbs around the school. The general appearance of the homes and streets bears ample testimony to the work of the Society, and some members are leaving an impression which will last long after they are gone.

NEWCASTLE: The Society gave its members the value of $1 in plants, shrubs, etc., in the spring, and this fall have distributed about 500 bulbs, Hyacinths, Tulips, Daffodils and Narcissus. Shrubs and vines were planted around the Public School and each of the four churches, and trees on the streets, each individual planting one under the supervision of Mr. Thos. Montague. It was surprising to see the number of window boxes that were put out this year, as against none before the Society started.

OAKVILLE: The directors of the Society endeavored to carry on the work as usual, offering to the public a generous list of options as an inducement, not only for persons to become members of the Society, but also to cultivate a taste for the beautiful in the masses. The list consisted of the choice of any of the following options: (*a*) The *Horticulturist* for one year; (*b*) Three of the best

Tea or Hybrid Perpetual Roses; (*c*) Six Delphinium; (*d*) Six Aquilegia; (*e*) One dozen Salvia; (*f*) Two Ferns. In this way were distributed 48 Roses, 60 Delphiniums, 24 Aquilegia, 26 Ferns, 6 *Horticulturists* and 36 Salvias.

The usual grant of $10 was also paid to the ladies of the Flower Guild, which adjunct to the Society is doing a splendid work among the children of the town by encouraging the cultivation of flowers and vegetables in their home gardens, offering prizes for the best. The Guild had 145 members and by supplementing our grant by private donations were enabled to make disbursements to the amount of $37.85. These disbursements took the form of six kinds of flower seeds to the girls and four of vegetables to the boys. Two prizes were given to the girls, a book on flowers by Mrs. John Cavers and a silver watch by Mr. C. Cox, and to the boys a set of garden tools by Mrs. C. P. Chisholm and a set of the same by ex-Mayor Featherstone.

The Society also planted in the town parks 361 Geraniums, 180 Coleus, 30 Fall Achyranthes, and 100 Dwarf Achyranthes. These planted one oval bed 35 by 15, and three rectangular beds 20 by 10, which did much to beautify the parks. These plants were set out in the same beds which had been ablaze with tulips for the two past springs, the bulbs not having been moved. This plan has worked admirably thus far.

The Directors, in view of the war strain, and fearing this may be felt more acutely during the next year, have carried over a balance of $65 to ensure the planting of beds and the carrying on of work as set forth above, should membership not increase.

ORANGEVILLE: Premiums given to members. Set out 12 flower beds with flowering bulbs and bedding plants in the town, also planted 300 evergreen and deciduous ornamental shade trees. Through the generosity of some of the members 3 acres of waste land were purchased for a Town Recreation Park and Children's Playground, and work has been done on its improvement. A trust deed has been made to the town of this property. The general appearance of the town has been greatly improved by the work of the members, and this is much appreciated by the citizens.

OSHAWA: The usual lines of work have been carried on with much pleasure and profit to the citizens. Membership a little smaller.

OTTAWA: Notwithstanding the very wet weather early in the season and the excessive and continued heat during July and August, this Society had a very successful year.

Early in the season plans were laid for extending the usefulness of the Society, not only to its own members but to the public at large. A conference was held at which suggestions looking to the extension of the work and the stimulation of interest were received and considered.

The Society by means of its generous plant and bulb distribution, exhibitions, garden competitions, lectures and meetings has contributed largely to the beautification of Ottawa.

Not only in the work accomplished has the Ottawa Horticultural Society had a successful year, but also in the number of persons enrolled, there being 901 members this year as compared with 614 last year.

A splendid booklet was published by the Society under the direction of Mr. R. B. Whyte, a charter member and past President of the Society, and also one of the capital's greatest horticultural enthusiasts. The booklet was

compiled by Messrs. R. B. Whyte, W. T. Macoun, F. E. Buck and J. B. Spencer and is entitled "Ottawa, the City of Gardens." It contains an abundance of information concerning the care of gardens and lawns, the making and keeping of prize winning gardens, and is beautifully illustrated throughout. Mr. Whyte bore all the cost in connection with the publishing of this excellent booklet.

During the year, four general meetings and exhibitions were held by the Society, each of which compared favorably with those of previous years.

The Garden Competition was conducted again this year. Prizes amounting to $173 were paid to winners in the "Front Garden" and "Rear Garden" (not exceeding 66 feet frontage) and in the "Window Box" Classes.

On July 22nd, the Directors at their own expense gave a garden party at the Central Experimental Farm, at which upwards of two hundred and fifty members attended. The guests were welcomed by the Director of the Farm, and by the President of the O. H. S., and after visiting the different departments of the farm, refreshments were served. This is the third garden party carried out by the Directors of the O. H. S., and the officials of the Experimental Farm, and was pronounced by far the best of the series.

Owen Sound: Membership for the year, 144, for last year, 140. As usual, the main business of the Society has been the financing, endeavoring to give the members fair value for their fee, and to pay up the show awards. More has been done for the benefit of the school children this season, cutting down money value of their prizes and expending this saving on fall bulbs for the grounds of our six public schools.

Paris: Interest in Horticulture in this town greatly awakened. Membership largely increased also receipts, due largely to publicity campaign carried on by the officers and directors during the spring. Successful Rose Exhibition held in June. Majority of members chose Rose bushes for their options.

Peterborough: Had a very successful year, membership having attained the 376 mark, which is the highest yet recorded by the Society. Two distributions of premiums to members were made, one in the spring being the choice of eleven options, and this fall, six Hyacinths, six Daffodils and six Narcissus, all first size named varieties; these have proved in every way a great help in retaining our membership. During the year a Lawn and Garden competition was conducted which was very successful, our different classifications being: 1st, lawns; 2nd, back gardens; 3rd, floral display; 4th, premises cared for by professional help. Competition was keen and more enthusiasm is being created each year. Another class may be added next season for Vacant Lot Improvement.

The Society cared for the City Parks as usual this year, making several permanent improvements, chief of which was the erecting of a fountain in Victoria Park on field boulders which adds greatly to the beauty of this park. Park flower beds were planted last spring and again this fall with bulbs.

Picton: Membership slightly less. The Society distributed in the spring, Gloxinias, Begonias, and in the fall a collection of fine Hyacinth bulbs was given. Seed was distributed to sixteen schools in the county to interest the children in growing flowers. The seed was distributed by the School Inspector and President of the Society. The result was very satisfactory.

Port Credit: In spite of the unsettled conditions prevailing on account of the war, the Society has carried on its work and has made headway. The factors mainly responsible for the curtailment of our endeavors were: Firstly, the energies

of the members were greatly devoted to war work of all descriptions; secondly, the dearth of young people, and thirdly, the summer drought which in a good many cases nullified the efforts put forth in the gardens.

During the year, four meetings were held at which lectures were given on Horticultural and kindred subjects.

The Annual Rose Show was not held last year for the reasons already stated, but the regular Fall Show held on Labor Day was a grand success. The Sections

Spiræa.

included flowers, fruit, vegetables and poultry, while the total entries in all classes were 230.

A start was made in the formation of a "Bird Branch" of our Society. Next year this subject will receive more attention, and it is hoped that it will be one of the most important which the Society takes up.

The Directors intend next year holding a competition for the best gardens in the village.

At the meetings, notes were taken of the speaker's suggestions and these were embodied in a notice to the members under the headings "Suggestions or Hints." In this way record could be kept of valuable information, which would be available at any time to any member.

In 1917, the Society hopes to hold two shows, one in the summer and another in the fall.

PORT HOPE: Members supplied with plants, shrubs and bulbs and *Horticulturist* furnished. The Society assisted in beautifying the hospital grounds, and civic property and urged on citizens the advantage of improving their premises and home surroundings.

RICHMOND HILL: Held Spring and Fall Shows, both of which were very successful. Public school children received flower and vegetable plants. Prizes were offered for best flower and vegetable gardens 6 x 12 feet. Several of the children were successful exhibitors. Twenty-five dollars were set aside for school ground improvement. Membership has increased.

ST. CATHARINES: Our Society has had a very successful year notwithstanding that a great many of our past members are now at the front on active service. Membership fell slightly short of the figure of 1915, but the Society distributed one-half as many more plants, shrubs, and bulbs as options than in 1915.

We followed the same lines as in past years, trying to instil a love of flowers into the younger generation, by distributing Aster seeds, and Gladiolus bulbs to the various schools in the city and district.

Owing to the adverse weather of the spring and summer, it looked for a time as if it would be impossible to keep up with our standard of giving the public first-class Flower Shows, but when the time came, the Society arose to the occasion, and some exhibits, if it were possible, exceeded those of other years. The proceeds from the sales of flowers, and from the refreshment booths, at the June and September Exhibitions were given over to the Red Cross and Patriotic Societies.

We undertook the laying out and care of the new St. Julien Park, at the entrance of the much needed new Burgoyne Bridge, and supplied flower-beds and hanging baskets at the Convalescent Home for our returned soldiers.

ST. THOMAS: Membership to date, 1,104, somewhat less than last year. Tulip Festival, May 11th, finest display of early tulips ever made in Western Ontario. Great interest displayed by residents of all surrounding municipalities. Visitors were shown about the city in sight-seeing automobiles, so that they might inspect the work done by the Society in line of public boulevard beds, parks, school grounds, and beautification of private residences and business streets. This show was an immense success, and will be made an annual affair.

Show of Darwin and May flowering tulips and other early flowers held on May 26th and 27th; 140 varieties shown, and much interest taken locally.

Continuous display of roses, gladioli, and various other flowers almost daily throughout the season in one of the windows of a leading jewelery store. Each bloom properly displayed in a suitable receptacle and labelled. This created great interest, as only the most magnificent blooms were shown. On account of prolonged drought in midsummer no Fall Show was held this year.

Society sent a display of 110 varieties of Darwin and other May flowering tulips to show at Tillsonburg.

John Dunbar, of Rochester, and Thomas Adams, of Ottawa, addressed our Society in the Spring. Both meetings were largely attended, and created much local interest. Prof. Tomlinson, of Guelph, visited our city, and looked over our work and gave many helpful hints on landscape gardening.

Pinafore Park continued to receive attention. Many rare shrubs, trees, perennials, etc., were donated by the Society. Among these were 100 varieties dahlias, 100 varieties perennial phlox, 100 delphinium in 25 varieties, 1 bed 109 varieties paeonies, 1 large bed 27 varieties Japanese paeonies, 1 bed of 50 festiva maxima, 100 varieties tall bearded iris, various flowering shrubs etc.

On boulevard beds 7,000 geraniums, cannas, coleus, and edging plants and 2,000 salvias were used. 25,000 tulips will be used for Fall planting. Photos of thirty typical views of local beds, etc., have been taken, and colored slides made therefrom for lecture purposes.

Wages and teaming on public beds cost $600 this year. One man all summer, four men in busy season in spring. All beds are labelled with name of variety of tulip or other plant.

Ten additional boulevard beds were laid out this year, and a large rockery erected at the end of Owaissa Street overlooking the ravine.

Beautification of balance of Railway Street was completed. Ground levelled and seeded, carolina poplars and lonicera tartarica planted to shut off view of fences, etc., beds of baby rambler roses in front. Work of placing cement urns at business corners continued. Two covered rest shelters 9 by 15 feet, have been erected on prominent corners, at a cost of $50 each.

Bouquets have been sent out weekly to the sick, and also to churches and public meetings.

For spring planting 20,000 gladioli, 1,200 shrubs and vines, 3,000 roses, of which 1,000 were purchased in Canada. Imported 500 autumn flowering crocus in September, tulips, hyacinths, paeonies, and other goods now arriving and to arrive this fall from Holland are invoiced at $1,400.

Delegate sent to meeting of Civic Improvement League at Ottawa, in January, and to meeting of Town Planning Conference of Western Ontario at Hamilton in October.

Society has tried to arouse greater interest locally in bird life and wild flowers. Have erected several bird houses in Pinafore Park, and showed a fine collection of bird houses at Tulip Festival in May.

SANDWICH: Membership increased 20 per cent. to 257. Flower beds in town number 70, as well as 16 large urns, which were set out with 3,000 plants. A boulevard bed was planted with 300 shrubs. The Society was instrumental in having the council remove all unused telephone and telegraph poles from streets. Weeds are cut by an employee of the Society twice during the season, all over town and thrice in the central section. Annual Flower Show held September 20th and 22nd, was a decided success. Premiums in shrubs and bulbs given to members.

SEAFORTH: This Society has had a most successful year with a membership of 110, as compared with 87 last year, and a corresponding increase in the amount of plants, shrubs, etc., sold, the increase being in roses and dahlias. The Annual Flower Show was held on September 13th, and the display for the season was truly remarkable and consisted of roses, dahlias, fuchsias, asters, hibiscus, coxcomb, gladiolus, sweet peas, petunias, stocks and salvia; the whole exhibit was turned over to the local Red Cross Society.

During the year the beds at the Public Building, Town Hall and Carnegie Library, were given some improvements, and two rows of shrubs were given to the Collegiate Institute. One box of bulbs for fall planting in the Civic beds has just arrived, and others are expected daily. With increased membership, and new blood added to the directorate, we look forward to another successful year.

STRATFORD: Membership is now 600, being approximately 100 over last year. A constant growth in the Horticultural interest is noticeable among citizens, resulting in more attractively laid out, and better kept grounds, than ever before.

The beds planted and cared for by the Society on the city streets now number 60, and in addition to these are planted a number around the Post Office. Six beds also were made and planted on the grounds of the General Hospital. Along with this, we filled ten large window boxes for the Post Office, and four for the City Hall. The beds mentioned have been cleaned up, and are again planted with Hyacinths, Tulips and Narcissi for spring bloom.

At the School Children's Bulb Show in February, there were 97 exhibitors, with 196 exhibits, and at their Flower and Vegetable Show in September, the exhibits numbered 112.

A Hamilton lawn.

Four monthly shows for the members were held, the exhibits consisting of hyacinths, tulips, narcissi, iris, paeonies, roses, sweet peas, gladioli, asters, zinnias and nasturtiums and while the various exhibits were not quite up to the standard of former years, adverse weather conditions being the chief cause, a greater interest was manifested, both by the members and the general public.

Eighty-three children were awarded prizes for their home gardens, these consisting of bulbs, to be grown in their homes for exhibition at their Spring Show.

In the lawn and garden competition for grounds cared for by the owners, there was an increase in entries, and prizes of $8, $5 and $2 were awarded.

For the floral beautification and care given the Public School Grounds, prizes of $8, $5 and $2 were given, causing healthy rivalry among the schools, which did much to increase the interest of both teachers and pupils in Horticulture.

Distributed in options, prizes, planting various beds, etc., 8,000 roses, flowering shrubs, perennials, geraniums, etc., and imports from Holland consisted of 29,000 bulbs, and plants principally hyacinths, tulips, narcissi, iris with 250 paeonies.

As in former years, we co-operated with Park Board, and by working in harmony with it, obtained the best possible results for our outlay and labor.

STREETSVILLE: The grant for Civic Improvement in 1916 was $25, and members of the committee are endeavouring to interest the village council to make certain improvements on Main Street, which is 100 feet wide, with a view to the Society taking up in conjunction with property owners the planting of trees and shrubs along its entire length. It is also expected that a flower show will be held in 1917.

THORNHILL: Membership has increased from 58 to 67. At meetings of the Society excellent addresses on gardening have been given, and also on Bird Life and other topics. Three trips to places of interest were taken, to Sir H. Pellatt's, Sir Edmund Osler's, and to Avoca Vale, to see the wonderful collection of roses there. Interest in gardening has increased, and the Society has set aside $75 for the improvement of the new school grounds, or some other similar purpose.

TORONTO: A past president of this Society, now a captain at the front, sent back the prospectus of a horticultural society that he had been instrumental in forming amongst the officers of the Engineers' Corps, "Somewhere in France." The Society donated two prizes and asked for a report of the season's work from this Past-President, a man who must grow something, even whilst under fire.

The usual monthly meetings of the Toronto Society were held, also two successful exhibitions. The work with the boys and girls has been extended into several additional schools, and was helped a great deal by an illustrated lecture given in each school very early in the spring, and by exhibitions held in the autumn.

WALKERTON: The work of the Society has been somewhat hampered this year on account of so many calls on the community in the interest of the Red Cross Society, Patriotic Fund, and other causes brought about by the terrible war in Europe.

The Society so far as their funds permitted, worked along much the same lines as last year. Each member was furnished with the *Horticulturist*, and last spring a premium of 40 cents in bulbs or plants was donated each member of the Society. The Society also furnished window boxes and geraniums to assist in beautifying the Public Library and grounds.

WALKERVILLE: While the membership in Walkerville shows a slight falling off, the energy and interest of our members has developed to a remarkable degree. The organization of a new society in Ford City, on our eastern boundary, naturally affected membership, as in past years we had many members from that municipality in the Walkerville Society. However, we were glad to welcome the Ford City Society into the Association, and our President and others did what they could to assist in its organization. The clay soil in this neighborhood suffered greatly this season. First, we had an excess of cold rains, followed by torrid heat and drouth, which tended to turn many gardens into cement implacements strong enough to support a 42 centimeter gun. It was only with the use of a coal-miner's pick that ordinary cultivation could be carried on. Under such circumstances we feel gratified at the results attained, and we believe Walkerville is the best and cleanest town in the world.

This year the Town Council appointed a Park and Boulevard Superintendent, who maintained a staff of men trimming trees, cutting boulevards and caring for flower beds. There was expended for this work, for which this Society takes no credit, the sum of $1,490.00.

We had a bird-house competition on a small scale, which proved quite a success, and we can recommend the experiment to all other Societies.

We distributed amongst members as premiums clematis, hardy tea roses, hardy perpetuals and standards, various sorts of hardy shrubs, rhododendrons, greenhouse plants, paeonies, palms, ferns and fall bulbs.

We had great difficulty in getting delivery of nursery stock early this spring, and, if the other societies in Ontario had the same experience it is time for this Association to take the matter up with the Government at Ottawa, in order to relieve Horticultural Societies of some of the custom duties and scale regulations, so as to make it possible to get part of our requirements in the United States. This last Spring we were unable to get even an acknowledgment of our order, and only after many letters and wires, long after the stock should have been received, were we told that, owing to labor conditions and other things, the order would be somewhat delayed. While this may have been the case in Ontario, yet every departmental and ten-cent store in Detroit had on sale for a month or six weeks, shrubs, roses, clematis, etc., at from ten to fifteen cents per root, individually packed and in first-class condition.

Westboro: Four meetings and two exhibitions were held during the year. It was decided to buy bulbs for indoor planting, and present them to the schools at Westboro and Woodroffe, prizes to be given for the best plots of plants grown by the children, and an exhibition of these to be held during Easter. Vines and shrubs will also be given to plant about the schools.

Weston: Membership increased from 158 to 192. Expended in plants and seeds for premiums $124.47. Held two Flower Shows, at which the entries far exceeded those of any previous year in quality and quantity, also held competitions in lawns, gardens, flower beds, window boxes, etc., awarded prizes amounting to $106, distributed 7 varieties of seeds, (5 vegetable and 2 flower) to 77 boys and girls of the Public and Separate Schools; awarded $23.75 in cash prizes for best exhibits of products from these seeds; in this class we had 144 entries from 40 different pupils. Organized a very successful competition in bird-house construction, open to the boys and girls, in three classes, viz., 2nd, 3rd and 4th book pupils, 28 entries were received, and cash prizes of $6.75 awarded. This was altogether the most successful year in the Society's history.

Whitby: Last spring the usual plan was followed of supplying bulbs, shrubs, and plants to members as their option from the Society. In addition to this, any members who wished to order extra supplies were supplied at cost price through the Society. This was not done with any idea of competing with local merchants or financial gain, but was intended to encourage the planting of flowers and shrubs. Last spring, the Society distributed about 500 packages of vegetable and flower seeds free of charge to the school children of the town, intending to hold a fruit, flower and vegetable show in the Fall.

Another line of work that the Society is endeavouring to take up through the Society, is the improvement of the Park, and other public property around town. It has been so difficult this season to get help, or to find the time to get people interested in this work, so that no very marked progress has been made so far, excepting discussion as to what should be done, but prospects are good for going ahead next season, and making some showing in the improvement of these places.

This fall the supply of fall bulbs for members who did not take their full option in the spring, has been ordered, and for members who have joined the Society since the Spring options were distributed.

WINCHESTER: The Winchester Horticultural Society has closed a very successful year. The membership has increased from 109 to 165, and greater interest shown in the work. Our Council having donated $100, and our Public School Board $25, we planted about 100 trees on Hydro and High School grounds, also many perennials, as well as annual flowers on Hydro, School and Church grounds. Distributed aster seeds in spring to school children, from which blooms of very fine quality were exhibited, and we awarded them prizes of Hyacinth and Daffodil bulbs. Held our annual flower show, which was a great success.

WINDSOR: Early last fall after the Annual Meeting, there was a membership campaign, which resulted in three hundred new members.

The Home Garden movement, which was so successfully started last year, was continued. 20,000 packets of seed were purchased. We sold these to the children at one cent each, giving each child one free packet with each order.

Vacant lot cultivation was also continued, and was a great help to many.

As usual we had our flower beds at principal streets intersections, there being about 12 new beds.

An innovation was the open meeting. We had several of these, some with local talent. Some of our members who have been very successful with their gardens, gave talks and lectures on their methods. Rev. Mr. Tebbs gave us a very interesting and illustrated lecture. This was very instructive and enjoyed by all. At each of these open meetings we had a short musical programme. This we found was a special inducement to get the members out.

Mrs. Grosvenor, of Detroit, who very kindly offered her services, gave us an illustrated lecture, which was also very good. Mrs. Grosvenor is at the head of the Home and School Garden and Recreation Commission of Detroit.

We had planned to have window flower shows throughout the season, but on account of the dry season we had only one, a Rose and Paeony Show in the large display window of the Cherney Grocery Company. We sold the flowers and gave the proceeds to the Patriotic Fund.

The inspection tour of the Home Gardens proved to the directors more forcibly than ever that this was a step in the right direction. There were over one hundred gardens worked entirely by school children, who were most interested in the work. A cup was offered for the school having the most Home Gardens, and prizes to those having the best gardens.

The Board of Education were more sympathic this year, granting us permission to have seeds distributed through the schools.

The Cameron Avenue School won the cup for having the largest number of Home Gardens, which was presented to the children in September, after school opened.

We held our Annual Flower Show in the Horticultural Building. We had a booth 30 ft. in diameter, decorated in patriotic colors, with palms and ferns. Tables were reserved for members' exhibits, and some for children's exhibits of both flowers and vegetables.

A cup was offered for the best exhibit for adults, and prizes for the children. These prizes also went to children of the Cameron Avenue School. Special mention was made of the floral flags made by two of the children in their exhibit.

Tea was served in connection with this flower show, which brought in quite a sum for the British Red Cross Fund.

WOODSTOCK: Membership 85. The main work has been the holding of flower and vegetable competitions, in which 25 gardens were entered. There were three classes—for amateurs, owners and renters. Last spring shrubs, roses, flowers, plants, gladioli and asters were distributed to the school children, and bulbs have also been sent out this Fall.

CHATHAM: Had a very successful year with an increase of members from 208 to 430, in addition to the 20 schools in the country, that took advantage of our special offer to supply them with flowers, shrubs or anything in our line at cost; they averaged from one to twelve dollars, but we do not include them as members. Planted 200 trees, but owing to the dry season only a third are alive. We have about 500 ordered for next spring. We planted flower beds around the City Hall

Floral Design, Rideau Canal Driveway, Ottawa.

and Court House and street corners, five large beds in Tecumseh Park, seven handsome urns, three of them nearly 6 feet high, and 2 drinking fountains. The band stands on Tecumseh and Victoria Parks have been repaired and painted and lavatory accommodation provided. About 250 Boston Ivy plants have been set around public buildings, and 13,000 bulbs have been received from Holland, ready for immediate planting. A number of boulevards have been made. Several public places have beautified their surroundings by planting trees and flowers. The Dowsley Spring and Axle Works have fitted up flower beds with a cement curbing, making the place a credit to the city. The Canada Business College planted a great number of shrubs. St. Andrew's Church lawn has been beautified for the first time with Purple Maple, Paul's Red Thorn Magnolias, Hydrangea, Wiegelia, Lilacs, beds of flowers, ferns, Boston Ivy, with 8 cement urns with flowers, making it very attractive. The flower beds along the streets have been watered by attaching a hose to the street sprinkler.

THE ROYAL CALEDONIAN HORTICULTURAL SOCIETY.

Rev. A. H. Scott, Perth.

I wish at first to say a few words to strengthen and encourage all of us in this great work that we are doing in this fair Province of Canada.

First of all, we should compliment our President on his first presentation to the Society; the Treasurer upon the excellent report that he has given, and the Secretary too, upon what seems to be the general prosperity that pertains to the branch of soil activity with which we are more intimately identified.

After having done that, we should not forget to derive the lesson that comes to us from the vacant places that have been created during the year through the deaths of three of the prominent horticulturists, who have taken part with us in our work of the past few years. I refer to Mr. John Cavers, of Oakville, to Mr. C. C. James, former Deputy Minister of Agriculture, and to the Hon. Mr. Duff, whose obsequies were observed yesterday in his native part of the Province.

That would naturally lead us to say a further word in passing, regarding our brothers, husbands, fathers and our men, who since last year have gone to the front, have given their lives for King and Country, and whose places are empty to-day, because of what they have done on our behalf.

The records of the first ten years of the Ontario Horticultural Association have been written. It is proper that we should be thoughtful as we cast the eye over this first decade and begin to plan for the future.

A dictum of Lord Bacon was this: "The vine produces more grapes when it is young, but better grapes for wine when it is old, because its juices are more properly concocted." Believing that the best for us should lie in the future rather than in the past or present, I thought that, if I called the attention of the Convention to-day to a Horticultural Society in the Mother Country, that has lived and prospered for a hundred years, it might give us an encouraging forward look, as we pass from the first into the second decade of our own history.

A little more than a hundred years ago, on the 5th of the last month of the year 1809, seventeen men met in a hall in Winburgh and, having called Dr. Andrew Duncan to the chair, resolved to constitute themselves a Society for encouraging and improving the cultivation of the best fruits, the most choice flowers, and the most useful culinary vegetables. This was the first practical step toward the formation of the Royal Caledonian Horticultural Society.

Certain noblemen, gentlemen and gardeners from a distance, who knew that this initial step was to be taken, expressed by letter a desire to encourage the movement. Office bearers for the approaching calendar year were appointed, with the Earl of Dalkeith as the first President. Associated with him were four vice-presidents, two secretaries, a treasurer, and a council of twelve, six of these to be amateurs, and the other six professionals.

The first work undertaken by the Society was to arrange for prizes. The first exhibit was a quantity of blanched sea-kale shoots. The first medal awarded was for the best radishes. And the first papers read were on the following subjects: The preparation of a specific medicine from the white juice of the lettuce, the curl disorder in potatoes, the gooseberry caterpillar and the onion maggot, the insect destroyers, and the remedying of canker in fruit trees.

When the society was a year old, it selected an experimental garden, and received a Government grant of $1,000 a year. Medals and prizes were features

from the first. About the fifth year in the life of the Society, exhibitors began to choose their own prizes, and among the articles chosen were "Spectacles, umbrellas, teapots, dessert-spoons, mirrors, fruit-knives, writing-desks, and such like articles. One successful exhibitor, who chose a toddy-ladle, to his chagrin found the Society drew the line at that implement, and he had to select something else."

In the year 1815, through a special subscription taken up among the members, the Society sent over a number of intelligent men to make a horticultural survey of the Netherlands. Two years after, a medal was offered to the gardener who had served for the longest period to the satisfaction of his employer, the same master or family, which medal was won by Alexander Greig, who served the family of Colonel Blair for forty-five years.

On the occasion of the Society's 14th anniversary, a banquet was held when 120 members sat down. The dessert was 80 dishes of grapes, 40 of peaches, nectarines, plums and apricots, 30 of apples and pears, 20 of gooseberries, 22 melons and 10 pineapples."

During the midsummer of 1824, an experimental garden on the Leith walk was laid out, and the same year the Society procured a Royal Charter. In 1837, one of their meetings was postponed on account of the death of King William IV. The following year was marked by an application from the Society to have Queen Victoria its Patroness, but Lord John Russell advised against the granting of the request, on the grounds that compliance would mean the patronizing of "local institutions of the Kingdom." A spicy correspondence followed between the Department of the Secretary of State and the Society, terminating in the reception by the Secretary of the Society of a letter dated August 6, 1838, in which it was stated that Lord John Russell had become satisfied that the Caledonian Horticultural Society did not fall under the class of "local institutions," and that, on further advisement, Her Majesty had been graciously pleased to consent to be patroness of the Society.

In 1829 special attention was given to the cultivation of the Hyacinth. A monthly paper was started the year following. A band of music from Glasgow was brought by swift canal boat to the great show of 1841. A new Horticultural Hall was completed in 1843, and on the same year an exhibition was held there. Among the exhibits were "six calceolarias from Archerfield, which had been carried all the way by two men on a hand-barrow—a distance of 21 miles." Each man had five shillings award for his work. In 1865 the Royal Caledonian and the Edinburgh Horticultural Amalgamated. The United Societies kept the Royal Caledonian name, and chose the Duke of Buccleugh as the first President. The first International Show was held in 1869, when 1,500 gardeners were visitors on the first day.

From this time on to the Centenary period, the Royal Caledonian went on overcoming difficulties, persevering in the good work, and contributing benedictions to the whole Kingdom. As thoughtful minds looked back over the 100 years, and traced the linkings between the past and the present, they noted that many flowers through neglect and otherwise had been lost to cultivation. They commented upon the fact that commercial considerations had interfered with the quality and finish of certain products of the garden. They rejoiced, however, to testify that the garden was entering more and more into the life of the common people. Then, as far as they could discern the future, in spite of hindrances and retrogressions gardening was bound to assume more and more importance, and to become a growingly influential factor in the better things of the nation, tending always toward the improvement of the generation, and to the elevation and happiness of the human race.

Before completing my contribution to this session of the Convention, I should like to bring you an uplifting word which comes as an echo from Daniel Webster. "Let us never forget," he says, "that the cultivation of the earth is the most important labor of man. Man may be civilized in some degree without great progress in manufactures, and with little commerce with his distant neighbors. But without the cultivation of the earth he is in all countries a savage. Until he gives up the chase, and fixes himself in some place and seeks a living from the earth he is a roaming barbarian. When tillage begins other arts follow. The tillers of the soil, therefore, are the founders of civilization."

Edmund Burke from his viewpoint advises that there should be a system of manners in every nation which a wide formed mind would be disposed to relish. And he has written down this suggestive sentence: "To make us love our country, our country ought to be lovely."

In my judgment one of the most helpful books in print for the people in young Canada, who aspire to make our country beautiful is, William Robinson's "The English Flower Garden." In one of his chapters he lays emphasis upon an element that is "as free as the clouds from man's power to spoil." He proceeds in his own winsome way to observe that "Every fertile country has its fragrant flowers and trees; alpine meadows with orchids and mountain violets; the Primrose scented woods, honeysuckle-wreathed and May-frosted hedgerows of Britain: The Cedars of India and of the mountains of Asia Minor with Lebanon: trees of the same stately order, perhaps still more fragrant in the warmer Pacific breezes of the Rocky Mountains and Oregon, where the many great pines often spring from a carpet of fragrant evergreens, and a thousand flowers which fade away after their early bloom, and stand withered in the heat, while the tall pines overhead distil forever their grateful odor in the sunny air. Myrtle, Rosemary and Lavender and all the aromatic bushes, and herbs clothing the little capes that jut into the great sea which washes the shores of Greece, Italy, Sicily and Corsica; garden stands scattered through vast Pacific Seas, as stars are scattered in the heavens; enormous tropical forests, little entered by man but from which he gathered on the outskirts treasures for store and greenhouse; great island gardens like Java and Ceylon and Borneo, rich in spices and lovely plant life; Australian bush with plants strange as if from another world, but often most delicate in order even in the distorted fragments of them that we see in our gardens."

Along the pathway of these sentences I find the climax suggestion for myself and my friend of the garden in our favored Ontario. "A man who makes a garden should have a heart for plants that have the gift of sweetness as well as beauty of form and color." Let the garden have the superior thing, let it be a living thing with its life fair to the eye, but mainly with its breath and essence coming from the Divine. There is a thing in the rose that the eye may not see. We term it aroma. There is a thing in friendship that makes it firm. We call it sincerity. There is a thing in service that renders it acceptable. We name it motive. These are all three beyond the range of ordinary vision, but without them the main thing is wanting. So in this that we stand for in this Convention let us have the soul of Horticulture. Possessed of that the outlook will be good, and lengthened experience will bring forth the testimony:

I have grown old upon the sacred sod,
A happy man who loved and tilled his ground:
A happy man who through the long years found
In every blade of grass the love of God.

R. B. WHYTE: I would like to draw attention to a feature which we worked out in our local Society and it is not mentioned by any other, so I think it might be interesting. Some three years ago we organized a Women's Auxiliary to whom the Society gives a small grant, and their work has been to gather together flowers during the summer and distribute them among the hospitals in the city. At exhibitions also we have given them the flowers for the hospitals. The cost is a mere trifle compared with the results that we get, and I would strongly recommend it to the other Societies.

THE CHAIRMAN: Before passing on I wish to call attention to the cup on the table. This has been donated by the St. Thomas Society in connection with their Spring Show. The competition is open to any Society in Ontario, St. Thomas alone being barred voluntarily. It is for the best twenty-five varieties of spring tulips, five blooms of each, and has been won this present year by the Tillsonburg Society. This exhibition is held in May.

BIRDS AND THEIR RELATION TO HORTICULTURE.

W. E. SAUNDERS, LONDON.

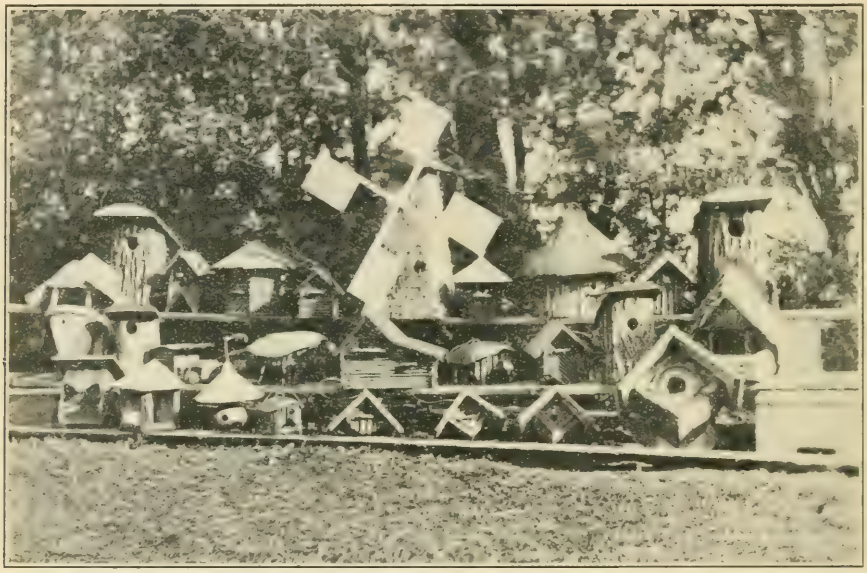
I need take no time to argue with you upon the advantages either of the presence of birds in the garden or of their desirability from your own material standpoint, because gardening is an æsthetic art, and every horticulturist is, to a certain extent, an æsthete on that account. I will, therefore, proceed directly into a consideration of what can be done for the birds, to induce them to live with you, rather than dilating upon the benefits that they can be to you, of which you are, no doubt, already convinced. This matter of bird encouragement resolves itself naturally into two sections, summer work and winter work.

In winter we have a different class of birds altogether. None of the horticultural winter birds are with us in the summer time, and none of the summer birds are with us in the winter time. That is a broad statement, not to be taken as strictly accurate, but it is approximately correct in the vast majority of instances.

And the methods of encouragement for birds in the garden differ just as widely as the species and the seasons. Just now to take up the consideration of the present. First of all, the birds that we have with us just now and that are of interest to us as horticulturists. And when I say of interest I do not mean of æsthetic interest only, but of actual value as well. These birds are comprised in what we might call "the small insect-eating class." There are many, chickadees, nuthatches and the small woodpecker; then there are also larger woodpeckers and the smaller kinglets and the smaller sparrows. We are mainly concerned with the small chickadee, particularly for the reason that it is the most useful of all of our winter birds. Now the reason it is the most useful is that it stays with us all the time. To say that the chickadee is on the job for twenty-four hours every day, of course would be an exaggeration, but it certainly is during all the period of daylight. These birds are exclusively insect feeders, less than five per cent. of their food being vegetable; that is, of their natural food; although the chickadees that I have at my house now eat a very much larger percentage of vegetable food because I give it to them. These birds spend a great deal of their time hunting insects and insects eggs; and when you consider what value birds give and ask the question, "In what can a bird spend its time to my best advantage?" of course it naturally follows that the

smaller life the bird eats, or to put it in another way, when it eats a certain insect in its smallest form it can digest the greatest quantity of them. And this bird being so small, while ten fairly large insects might be all it could feed on, if it eats their eggs it can consume 10,000.

The methods to attract these birds in winter (the easiest method to attract all of them—the white breasted nuthatch, the downy woodpecker) are alike. They all eat fat. If you will hang out in your trees, outside your living room window, a ball or a chunk of fat, preferably beef fat, the birds come to feed on it. If you will prepare for them a little food shelf or slab, take a little piece of bark and in the natural grooves put some nuts, and having put the broken nuts in the grooves drop upon them some kind of solid meat fat and that fastens the fragments of nuts there, you can then put it up against the side of a tree. The most interesting plan from your standpoint and mine is to make a raised shelf outside, to raise your window



Various types of bird houses.

sills up to the level of the glass, and then raise your food slab up to the window sill. In that way everything that occurs on that slab is in full view to yourself, and of course that is of interest to you.

I have, outside of my dining-room window, a little slab of this kind, and on this those little chickadees come. They are there all the time. It is almost impossible to spend five minutes between daybreak and four p.m. without having one to five chickadees around there all the time, and the rest of their time they spend examining the nearby trees for insects.

I do not know just how far one may go in statements about the value of birds to horticulture. I have read some extraordinary statements. J. Warren Jacobs, of Waynesburg, Pa., one of the pioneers of the bird boxes, says he never sprays his fruit trees and he has neither insect nor scab. Now scab is drawing on one's credulity pretty far. But possibly the utter absence of the other insects may produce such a healthy growth among the trees that they are not subject to fungus. That may be the case.

Now in addition to the chickadees we have with us in winter, feeding in the garden on the slab, the little downy woodpecker, and occasionally the hairy woodpecker—both equally useful except that we have more of the little birds.

In addition we have the white-breasted nuthatches and sometimes the red breasted. Now all of these birds are amenable to winter feeding, and not only to feed outside of your windows but inside. Last February I went over to London South one Sunday afternoon to see for myself the success that some friends, the Middletons, have had with feeding birds. When we went into the kitchen there was a chickadee on the feeding slab outside the window. He flew away when we went in. Mr. Middleton raised the window, got me to stand beside it with some nuts in my hand, and the little chickadee sat on my hand and ate the nuts out of it. It had never seen me before, but it knew anyone at the Middletons was a safe person and it came into my hand without any hesitation whatever. Then Mr. Middleton took charge of affairs. He put a saucer with nuts on the kitchen table and we went on one side to watch. The bird came in, went to the kitchen table, took the nuts and went out. Mr. Middleton held in his hand a walnut, not entirely broken, just cracked open so that the nut was exposed, but the nut could be taken out, and the little fellow came and sat on his finger and hammered on that nut and really it was remarkable to see the force that little bird could exert. I noticed the same thing myself often when sitting at my breakfast and hearing the pecks of the little chickadees sitting on the slab.

In the winter time food is about the only thing that we can supply for the birds, but it is not quite the only thing we can give them. Every gardener should every autumn put in his garden a brush heap. If you have not tried it you will be amazed to see how fond the birds are of it. In that you can throw millet seed for the sparrow. A word about the English sparrow. There are a great many traps made for the sparrow, and they are all of them moderately effective, but the best one is the simplest, that is the box that is merely placed on its end with a stick and a string to your window, so that you can pull the string and catch them. I hope you do not think it is inhuman in any way to destroy this introduced bird. The wild life that the creator put on the North American continent is useful, but the chief work of the sparrow has been to drive away our native birds, and you will find that if you take the trouble to minimize his movements the native birds will come back to you in increasing numbers in consequence.

I will tell you what success has been attained by Mr. J. S. Wallace, one of the Toronto members, on a little island in the Rideau Lake. About six or seven years ago Mr. Wallace decided to do what he could for the birds of that Island. There were then an average of five breeding pairs on that island. He made that island a safe place. The first thing he did was to get his friends to leave their cats at home. Mr. Wallace then proceeded to exterminate the red squirrel from the mainland in the winter, and also the bronze grackle. If you want to make your place safe for the birds you have to eliminate the cat, the red squirrel, the bronze grackle and the English sparrow; also the blue jay which destroys almost all the birds nests he can find. When Mr. Wallace had made his island safe immediately the birds began to increase, and in five years the number of breeding birds had increased on that little island from five pairs, not to ten pairs or to twenty pairs which would have been enormous, but to thirty-three pairs. That, I think, is the most creditable piece of work that has been done in the way of bird protection for the small birds in Canada.

Now coming to summer conditions. We have a different class of birds to consider and we must treat them in a different way. Of course we cannot have a brush heap in our garden. No man can stand for a brush heap in his garden unless he has a very large garden and can hide it away, and you do not want to hide it, because you want it to be within sight of the birds. But in summer a most desirable thing for the birds is water, and water is best provided for them by a little dripping and bathing pool. It is fortunate that the birds are not very fastidious. I was talking to a man the other day about hen's eggs, and I said what difference does it make whether a hen has been sitting on them a few days or not, except that they are perhaps not quite so fresh, and he admitted in the end that he was prejudiced. The birds are not prejudiced. They will bathe in the water first and then drink it afterwards. No, you need not provide separate drinking and bathing water, although, mind you, they appreciate it if you do. If you will have a little fountain dripping down and give them a little pool of fresh water to drink they will drink it, but failing that they will drink the bathing water and say "Thank you," too. The bird nesting box is a most useful way of encouraging the bird. You remember Jack Miner's experience in the spring of 1915. He is the man who has done that spectacular work with geese. He has some 2,000 geese come to his place at Kingsville where they live in absolute security so far as he and the neighbours are concerned. But on four different occasions last spring Jack Miner tells me four different flocks of swans flew over his place to see if these yarns that the geese had told them were true, and they saw the geese, of course; but they saw the house and the people and they thought this thing could not be true. You see the seed had been sown and the swans had got the idea. When you get a pair of blue-birds to your place you may attract a pair of orioles who will come because of the birds who are already there. In the spring time in these nesting boxes you may have everyone of these birds, the downy woodpecker, or the white breasted nuthatch, but you are more likely to get the blue-bird and the crested fly catcher, the tree swallow, and perhaps the most likely for you to get among the larger birds is the flicker, and the smallest and most likely one of all is the house wren. They are all attracted by bird houses in summer. In addition there is the purple martin. Of course all these birds use special houses, and it stands to reason there would not be the same entrance for a wren and for a flicker. All these birds are fairly easy to entice to your place and wonderfully interesting after you get them there. Another bird that you may get if you have a large box is the screech owl. He is not an insect eater and you need to keep your eye on him. You have read of the man-eating tiger in India. The man-eating tiger is an exception; you may have thousands of them and among them you will find one occasional man-eater. The same thing occurs among the screech owls. As a rule they feed almost exclusively on mice. Occasionally you will find a screech owl that will cultivate a taste for bird's flesh, and that is a type of bird that you can hardly afford to have around your place.

I want to mention the oriole to you not because it is specially easy to attract but because of the peculiarly attractive work that has been done by Mr. Cull at Puslinch Lake, near Guelph. Mr. Cull had a pair or two at his place and by means of putting out nesting material, that is pieces of string and thread, he succeeded in having, I do not know how many pairs. The change in numbers came very suddenly, in one or two years, just because he put out nesting material. This business of bird protection is in its infancy. We cannot say to-day what can not be done. A great many things can be done, and everyone of them interesting to the horticulturist.

When I was referring to the winter birds I forgot to mention, for the sake of those who live in the most southerly part of the Province, the red bird. They live largely on corn.

The last bird that I want to speak of is another one to be discouraged, and that is the cow bird, both male and female. The special reason for the discouragement of this bird is that it lays its eggs in other birds' nests, and if there is a little warbler nesting with its eggs laid and a cow bird comes around, the chances are that the cow bird will lay its egg in the warbler's nest, and the little warbler will succeed in raising only the cow bird, the reason being that the cow bird is large, it grows faster, and before a great while it has succeeded, by a process of elimination entirely satisfactory to itself, in getting rid of the young warblers, and instead of having had a lot of warblers on your place there is the cow bird. The cow bird

A Flicker entering its bird house.

classes itself with the English sparrow. It goes with it, although it is a native bird. It has increased wonderfully in numbers since the white man has taken a hand in affairs on the North American continent. It is time for us, after having caused the bird to increase, to take care of that increase ourselves. We should not leave everything to nature and yet we must be very discriminating, and in our efforts to do anything inimical to any bird we must be sure of the species we are doing it to.

R. B. Whyte: I note that Mr. Saunders did not say anything about the robin, and my great enemy is the robin. The robin eats half the raspberries that I grow and a great many of the cherries.

W. E. Saunders: Mr. Whyte might also mention about 250 other birds of which I did not speak. With the robin one may include the cat bird and others. Those birds were here before us and fed upon native fruits. While the proof is not yet absolute, it is believed that the birds prefer native to imported fruits, and if you

will spare out of your enormous city lots room enough to give the birds all the native fruit that they want they will not bother your imported fruit at all. Can you blame the boys if they see a tree full of cherries and want some of them?

MRS. CADWELL: I have had more pleasure out of a lot of 50 robins this summer than anything I could mention. I have gone so far as to take a picture of my pet robins and I was going to bring it up here to show it to the Society as a novelty.

JOHN GLASSFORD: I had thought of saying a word or two about birds at this meeting, not knowing we were to have an address on birds until I received the programme which informed me that Mr. Saunders, of London, was to address this meeting on birds and their relation to horticulture. I take great pleasure in moving a hearty vote of thanks to Mr. Saunders for his able, eloquent and inspiring address.

The wanton destruction of birds and their nests in the past seems to me to require more than mere mention to save song and insectivorous birds, or at least a number of species from becoming totally extinct, and to save them for their value to man alone, if for nothing else.

Whether a bird is beneficial or injurious depends on what it eats. Some birds are accused of eating this or that product of cultivation, when an examination of the stomachs shows the accusation to be unfounded.

Accordingly the Biological Survey of the United States Department of Agriculture has conducted for some years a systematic investigation of the food of those species which are most common about the farm and garden. I will only ask your attention to two or three of the most common. The grackle or blackbird is accused of many sins such as stealing grain and fruit and robbing the nests of other birds. An examination of over 2,000 stomachs shows that one-third of its food consists of insects, nearly all of which are injurious. The stomach contents do not indicate that it robs the nests of other birds to any great extent, as the remains of birds and eggs amount to less than half of one per cent.

An examination of over 1,200 stomachs of robins shows that forty-two per cent. of its food is composed principally of insects, the remainder is made up of small fruit or berries. If Russian mulberries and the common elder were planted around the farm and in every schoolyard as food for the robins they would not bother other fruit very much.

An examination of over 800 stomachs showed that sixty-eight per cent. of the food of blue birds consists of insects, while the other thirty-two per cent. is made up of various substances found mostly in stomachs taken in winter. Examination of over 200 western blue birds showed their food to consist of insects to the extent of eighty-two per cent.

The food of six varieties of swallows was found to consist entirely of insects, most of them either injurious or annoying, and the number destroyed are not only beyond calculation but beyond imagination.

An examination of over 350 stomachs of phoebes showed that over eighty-nine per cent. of the year's food consisted of insects, while wild fruit constituted the remainder. Year Book for 1911 of the United States Department of Agriculture states that thirty-six species of birds attack the codling moth. In some localities the birds destroy from sixty-six to eighty-five per cent. of the hibernating larvæ of these insects. More than fifty species of birds feed upon caterpillars and thirty-six species live largely upon destructive plant insects.

What does the destroying of an insect mean? The United States Biological Survey states that the green leaf louse, a very destructive insect, multiplies at the

rate of ten sextillion to the pair in one season. One pair of potato bugs multiply from fifty to sixty million in one season. The gypsy moth would in eight years result in the defoliation of all the trees in the country if allowed to go unchecked. The native birds are worth millions annually to the country on account of the service they render by destroying insect life.

"Save the birds," and never let us forget that birds are for two purposes, to gladden us with their wonderful color and song, and grace, and to make the world fit for us to live in it, for without the birds to eat the insects every hour of every day of every year all the crops and all food would be destroyed.

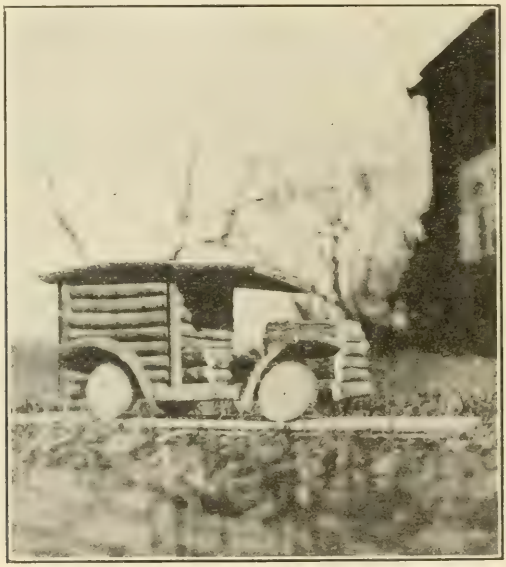
On behalf of the birds and the country in particular I make the following motion: "That the Ontario Horticultural Association, recognizing the immense value of bird life, resolve, that ornithology and the conservation of bird life shall be directly associated with the work of horticulture.

"And that this Association will use every reasonable endeavor to enforce the laws for the protection of all song and insectivorous birds.

"And will encourage the teaching of practical ornithology in all the schools; the establishment of bird sanctuaries in every city, town and hamlet; the planting of shrubs, trees and vines that will attract and feed the birds; the building and placing of artistic and safe bird houses, and the feeding of birds in the winter." Carried.

Inspector Taylor, St. Thomas: I would have liked to have had the pleasure of bringing that motion before the Convention; more than that I would have liked to incorporate in that motion, that the cat should be practically destroyed from the face of Ontario, anyway. Perhaps you do not agree with me. I am the most inveterate hater of the cat; I will not take second place in the destruction of the animal. In the address which we have just listened to from Mr. Saunders you and I felt pain and regret that we did not have the intimate knowledge of birds he has displayed. At the present time I do not know that there ever was a time when it was so incumbent upon us to look after bird production as at the present moment, and it is impossible for us to give too much attention to the birds. It is regrettable that when a person visits a farm house or goes into the cities and towns and villages, he will see there large numbers of the ruthless species of animal creation known as the cat. The cat had its uses in the days gone by, and so long as these species are contained in what we call the balance of nature, so long are they useful to them. The very moment that the balance of nature becomes destroyed through the change in environment it should be removed. When man made his advent in the Province of Ontario we had large forests, we had many hollows which were filled with water. The food of birds was then the insects. With the coming of man species of insects have been removed, with the result that the insects which preyed and lived upon them have become predatory upon other things. And so numberless insects that have had their environment changed, have now resorted to cultivated plants, and the menace is increasing, and I wish to call your attention to the great increase that will occur. This great war is going to change the environment of everything. We are going to have a vast immigration here from other places and the insects that are not now known will in a few years find their place here, and for that reason it strikes me that we should enter a crusade against the cat. What are the conditions? The birds in olden days nested in the forest. In these days the trees were thick, the shrubbery was thick. In order to find safety they were driven from the forests to the farm. Everybody knows that birds that are hatched can fly. That cat is strolling around and it, coupled with the snake, should have no place in the animal creation. A bird house in a home that has a cat is out of place. If we are to

encourage the production of birds, the great value of which no person will for a moment dispute, the very first crusade that we must enter into as horticulturists, recognizing the great value of birds, is the destruction of the cat. You may say that the cat is of use. So it is. It will catch mice only so long as it will not get birds. I live in the City of St. Thomas. I have not a cat, and I do not intend to have one. My neighbors have cats and again and again I have watched those cats hide behind a shrubbery or behind a board, and in a few minutes you will see the cat come out with a bird. It is much easier for the cat to live on birds than on mice. The mouse is a secretive animal, difficult to capture, and the cat, as a result of that, if it had to live on mice, would go with an empty stomach. Many and many a time when it cannot get the mice it gets the birds. And many a time when it gets a bird away in some tree there are four or five eggs or little birds which perish for want of the necessary care, so through the tragedy of one life taken you add four or five little birds taken.



An automobile bird house.

I would like to enter a defence of the English sparrow. He, like other birds, has his friends, and it is true that the English sparrow has been instrumental in driving away many of our birds; but it is true also that perhaps the reason he has driven away those birds is because he is a winter bird, and, consequently, he inhabits the nests of other birds and when the swallows return they find him occupying their nest. Then too, is it not a fact that the English sparrow is of inestimable value in the destruction of weed seeds in the fall and spring. I had the pleasure of reading in the London *Free Press* a couple of years ago an article in defence of the English sparrow, where the writer stated that he had killed several English sparrows and in one stomach he counted 173 insects and in another 167. So that even the birds that we most despise are instrumental in keeping down the insects.

I am a lover of the robin. I once shot a robin and took great pleasure in shooting them until one day I went to school and the teacher told me this touching little

story as to why it was called "Robin Redbreast": When the Saviour was hanging prostrate on the cross, the crown of thorns sticking on his forehead, a robin flew upon the Saviour's brow, pecked out the thorns, got covered with the blood, and ever since then has been called "Robin Redbreast." That ended my shooting of robins.

THE CHAIRMAN: I would like to ask Mr. Caverly if those mud turtle bird boxes frightened the birds.

C. CAVERLY: I have not tried them yet, but I find the wrens will take to anything. I have known them to nest in a ball of binder twine, in a milk can turned upside down, and also in our town a man had a pump in his well and the wrens bothered him building in the spout and over the pump handle until he took the pump out and drew his water with a pail and hook. Wild ducks, however, are naturally afraid of turtles.

PROF. MACOUN: Has anyone had any experience with tree swallows nesting in these houses? How low should the boxes be put for them?

C. CAVERLY: There are no tree swallows in our neighborhood so I cannot answer that. I have some forty or fifty boxes on my place.

PROF. MACOUN: What birds have you found to go in them?

C. CAVERLY: Blue birds, wrens, flickers, woodpeckers, chickadees and phoebes and robins in the open shelters.

The nomination and election of officers and directors for the ensuing year resulted as on page 6.

Moved by R. B. WHYTE, seconded by Dr. F. E. BENNET, "That in future the Honorary Director shall be considered a director in full standing on the Board of Directors." Carried.

A hearty vote of thanks was tendered to the retiring President.

DISEASES OF ROSES.

DR. L. M. MASSEY, CORNELL UNIVERSITY, ITHACA, N.Y.

Probably the most noticeable phase of the subject "Diseases of Roses" is the scarcity of definite information. This applies both to the nature of the diseases and to control methods, for these two factors are so interrelated that ignorance of one means ignorance of the other. All who have made an effort to obtain detailed information concerning any rose disease have been forced to the realization of this unfortunate situation. It is regrettable that the "queen of flowers" should have had its maladies so woefully neglected.

Probably rose growers are more to blame for this state of affairs than anyone. It is but natural that the plant pathologist should direct his efforts whence the loudest call for help originates. Certainly this has not been among the growers of roses who have been too content to suffer yearly losses from diseases without demanding the assistance of plant pathologists.

When the editor of the *American Rose Annual*, the official organ of the American Rose Society, endeavored to obtain an article on rose diseases for the 1916 issue he found that the information available was so scant that it was practically impossible to obtain such an article that would contain more than a brief mention of the various diseases and their causes, together with a few suggestions for treat-

ment that might possibly prove effective. Professor H. H. Whetzel, of the Cornell Agricultural Experiment Station, wrote a short article for the *Annual* indicating a few of the more important diseases. He emphasized the need of rose disease investigations together with the placing of both the information already at hand and that to be brought out through investigations before the growers in a practical manner. Recently an agreement was drawn up between the American Rose Society, the New York State College of Agriculture and myself, whereby my time should be used in the investigation of rose troubles, the Society contributing money to help meet the financial end of this undertaking.

Work upon this project was begun in August. First of all it seemed desirable to obtain some notion of the number and kinds of diseases which were causing the most serious damage to rose plants in America. In order to determine these points many of the large rose establishments have been visited and the number, kinds and extent of diseases noted. Also many growers have co-operated in sending diseased material together with whatever observations they have made regarding the disease. In this manner they have materially aided the work. The specimens sent have been examined and the growers furnished with all available information regarding the cause and control of the disease. If the trouble proved to be new, of unusual interest or of a serious nature, special work has been started to determine the unknown facts regarding the disease.

The survey has shown the two most destructive rose diseases to be powdery mildew and black spot, both on indoor and outdoor plants. Probably rose growers in general are better acquainted with these diseases than any of the many other diseases of the rose, and yet the greatest possible differences of opinion exist among growers as to their cause and suitable methods of control. However, this is not altogether surprising, for many points in the life histories of the causal organisms remain to be determined, as well as the best methods of treatment for the control of these diseases.

However, the survey has shown other diseases than mildew and black spot to be causing growers considerable damage. The disease known as crown gall is causing much loss. A root disease of American Beauties and Ophelias has been noted which is causing the death of many plants under glass; and leaf spot diseases, other than black spot, of outdoor roses, especially of Ramblers, do considerable damage to plants. Nothing is known concerning the cause and control of the root rot, and our knowledge of the leaf spot diseases ends with the name of the causal organisms.

Following is an enumeration of the most important rose diseases together with the generally accepted ideas regarding their symptoms, cause and control. It will be noted that in most instances the information concerning the life histories of the causal organisms and methods of control is indeed scant, so that much of what is given here is more on the order of suggestions and conjectures than experimentally established facts.

1. Powdery Mildew.—One of the most common and injurious diseases of roses, wherever they are grown, is powdery mildew. The disease has been known for a long time. It is a serious disease of indoor roses and some outdoor varieties, especially of Crimson Rambler.

Symptoms.—The first signs of the disease are grayish or whitish spots on the young leaves or shoots. Later the spots have a white powdery appearance, a felt-like coating being commonly found on the stems and thorns, while still later the mildew appearance is lost and the spots show a dark color.

The young leaves, stems and buds are dwarfed, curled and variously deformed by the disease. This deformation and killing of parts of the leaf surface reduces the foliage and many of the injured leaves drop. Growth and flower production is seriously interfered with, often the young buds themselves being attacked by the mildew, thus rendering the flower clusters entirely worthless.

Cause.—Powdery mildew is caused by the fungus *Sphærotheca pannosa* (Wallr.) Lév. *rosæ* Wor. An examination of a diseased leaf will show the fungus to consist of slender white threads with numerous branches which form a net-work over the surface of the leaf. At various points on the mycelium upright branches arise which bear on their ends chains of minute egg-shaped bodies (spores) which are easily detached. These are known as conidia. In older spots these conidia lie in masses on the surface and give the diseased area its powdery appearance.

When mature the conidia drop from their stalks and are blown about by the slightest currents of air. They are thus carried to other leaves where under the proper conditions of temperature and moisture they germinate. The little thread which comes from the spore grows rapidly, branches, and in a few days produces a new crop of spores.

At various points the threads are attached to the surface of the plant, and minute branches or suckers are sent into the outer cells of leaf or stem from which the fungus draws its food supply. Not only is the plant injured in this way, but possibly the fungus also interferes with vital processes of the host through the presence of the felty mass upon the surface which cuts off the light.

These conidia are not long-lived. But another spore-form exists to carry the fungus over long periods unfavorable to the growth of mildew. Somewhat rarely, and chiefly out-of-doors, ascospores are produced in little spore cases (asci) which appear as minute dark fruit bodies (perithecia) embedded in the felt-like mildew on stems and thorns. These ascospores can live over winter out-of-doors and may serve as the inoculum the following spring.

Treatment.—A. Outdoor roses. Powdery mildew on outdoor roses may be controlled by dusting with finely ground sulphur. The first application should be made at the first signs of the disease, and subsequent applications made at intervals of about ten days. Spraying with potassium sulphide, one ounce to three gallons of water, or with a solution of ammoniacal copper carbonate is held to be effective.

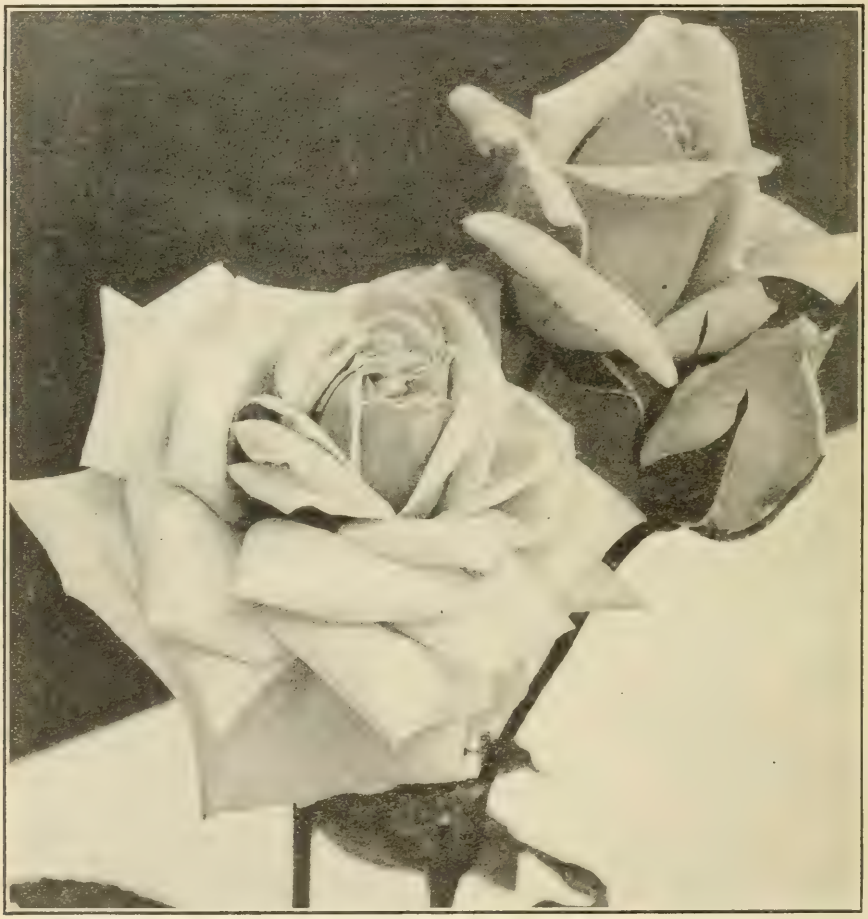
B. Under Glass. The above methods for the control of powdery mildew on outdoor roses will undoubtedly also control it under glass. However, a more desirable method lies in the use of vaporized sulphur, produced either by boiling sulphur in a pot over an alcohol lamp, or by painting the heating pipes with equal parts of sulphur, lime and water. The sulphur vapor is produced by boiling sulphur over an alcohol lamp, or some such method of heating, at times when heat is not on in the house. It is a matter of common observation that mildew is most serious in the autumn and growers would do well to obtain an apparatus to generate the sulphur vapor at these periods in order to prevent the mildew from getting a hold before the heat is started.

2. Black Spot.—Next to the powdery mildew the most common and destructive disease of roses is black spot. Roses grown both out-of-doors and under glass are affected.

The disease is most destructive during the summer. Affected plants become defoliated early in the season and the leaf buds which should remain dormant until the next year, open late in the season. As a result of this defoliation the plants may

blossom poorly or not at all during the following year. Also, due to the late season growth the plants do not enter the winter in a ripened condition and are thus more susceptible to frost injury.

Symptoms.—The more or less circular spots on the leaves may obtain a diameter of a centimeter or more, are of a black color, and are characterized by an irregularly fringed border. The spots occur on the upper surface of the leaf and by confluence may involve the entire surface. Frequently the leaves become yellow,



Killarney Roses.

both in the invaded and uninvaded tissue. Defoliation soon takes place. Bush varieties are held to be more susceptible than the climbing varieties.

Cause.—The black spot disease of roses is caused by the fungus *Diplocarpon rosæ* Wolf (more commonly known as *Actinonema rosæ* (Lib.) Fries).

Unlike the powdery mildew fungus this pathogene does not appear on the surface but works underneath the cuticle of the leaf and in the tissues. The black color of the spot is due to the death of cells beneath the subcuticular mycelium.

Like the powdery mildew fungus two spore-forms exist for the black spot fungus. During the summer small black pustules appear on mature spots, apparent

to the naked eye, which are the fructifications of the fungus. In these fructifications the conidia are born. These conidia are blown about by the wind and falling upon a leaf they germinate under proper conditions of temperature and moisture and produce infection.

The second spore-form (ascospore) develops during the winter. When old diseased leaves fall to the ground in the autumn carrying the fungus with them, the pathogene does not die but lives over winter saprophytically in the leaf tissues. Here spores are formed in sacs (asci) produced in small shield or spherical shaped bodies called perithecia. These ascospores are discharged from an apical pore and pile up in whitish masses in the opened mouths of the perithecia. They are mature by the time the leaf buds have begun to expand in the spring and are carried to the newly developing foliage by the wind, where under proper conditions of temperature and moisture they germinate and produce infection. Within eighteen days after infection by ascospores a crop of conidia or summer spores will develop.

Control.—Two methods should be employed in the control of black spot, (1) sanitation and (2) application of fungicides. Best results will be obtained where the two methods supplement each other.

(1) Sanitation. Since the fungus lives over winter on fallen leaves, where spores are produced which serve as a source of infection the following spring, it follows that these old leaves should be carefully collected and burned, either late in the fall or early in the spring before the buds expand. This refers especially to outdoor roses, as it is probable that the winter spore-form is not formed under glass. However, it is advisable to keep the benches free from old leaves affected with black spot for they bear the conidial spore-form and thus serve as sources of infection.

(2) Application of fungicides. Sanitation alone will fail in the control of black spot and must be supplemented by the application of fungicides. Present recommendations call for the use of liquid fungicides. It is held that any of the standard copper compounds will give satisfactory results. Bordeaux mixture, especially for roses under glass, is objectionable in that it coats the foliage. A solution of ammoniacal copper carbonate is probably just as efficient and lacks the objectionable discoloring feature of Bordeaux mixture. Spraying with these fungicides should be begun before the disease appears and continued throughout the season at intervals of a week or ten days in order to keep the foliage covered with the fungicide.

Some claim to have had good results by the use of a solution of formalin or potassium permanganate, spraying with these fungicides after the disease appears, the theory being that the solution kills the spores of the fungus. However, not enough work of an experimental nature with these solutions has been done to warrant their being here recommended. We are hoping to be able to test their efficiency in the near future.

One of the most important points to be investigated concerning black spot under glass is the relation of temperature and moisture to the development of the disease. It is a matter of common observation that the disease starts during late summer before firing begins, and the severity of the disease during the winter depends largely upon the start made at this time. Some of the most badly diseased houses have been noted where firing was begun late. When the conditions favorable to black spot are known a big step will have been taken toward the control of this disease under glass. At present sanitation is a big factor, and it is the writer's opinion that the severity of this, as well as of other indoor diseases, can be lessened by more strict attention to the heat and moisture requirements of plants in the autumn.

3. Crown or Root Gall.—This is a very common disease of the rose, both of indoor and outdoor plants. It is the common crown gall disease of the nursery, affecting many woody plants, trees and shrubs, as well as herbaceous plants. Roses in benches are frequently severely affected.

Symptoms.—Crown gall exhibits itself by the production of galls or tubercles usually about the roots or the crowns of the plants, but not infrequently on parts of the plant above ground. The galls are of various sizes, frequently reaching a diameter of several inches.

Cause.—Crown gall is a bacterial disease caused by *Bacterium tumefaciens* Smith and Town. The bacteria which apparently must enter the plants through minute wounds stimulate the development of certain cells in the host plant resulting in the formation of large galls. The disease has been likened to cancer of animals.

These bacteria may be able to live in the soil, possibly for a considerable time without losing their virulence. When healthy plants are placed in this infected soil they are attacked by the bacteria.

Control.—All plants should be carefully inspected for galls before they are set in the benches. All cuttings showing galls should be rejected. Since the bacteria are able to live in the soil, that in which diseased plants have grown should be removed or else sterilized by steam before healthy plants are planted in it. When infected soil is removed the benches should be thoroughly disinfected. The gathering and burning of galls may be of some value. Once a plant is affected no treatment will cure it.

Opinions differ as to just how much damage this disease does to roses. Some growers claim it causes little injury, while others maintain that plants are stunted and otherwise injured. Considerable investigation remains to be done on this disease.

4. Rose Rust.—This disease has been reported occurring on both indoor and outdoor roses, but seems to be uncommon under glass, at least in America. It is abundant on wild roses.

Symptoms.—The disease manifests itself in early spring as orange, powdery patches on leaves, shoots and buds. Frequently the greater portion of the surface of the leaf may be covered. The patches on the wood are often large and distortion or curving of the part affected may occur. About midsummer the patches become deeper in color. Toward autumn black pustules are to be found on the underside of the leaves and on the stems. The stems of some varieties are killed to the ground.

Cause.—Rose rust is a fungus disease, caused by several species of *Phragmidium*. There are several spore-forms, all being produced on the same host. The orange powdery patches on the leaves in the spring are due to a type of spore called æciospores. Later, indicated by the deepening of the color, uredospores are produced. These spores serve to disseminate the fungus during the summer. In the autumn teleutospores are formed, their presence being indicated by the minute black dots on the leaves and black eruptions on the stems. These teleutospores serve to carry the fungus over the winter, living on fallen leaves or affected canes.

Control.—When a plant is badly affected it is usually advisable to cut the entire plant away close to the ground. Since the fungus winters in the form of teleutospores on fallen leaves and diseased stems, these should all be collected and burned. Spraying with various fungicides has been suggested but more experimental work is necessary before it can be recommended for practical use.

5. Downy Mildew.—This is particularly a disease of greenhouse roses, but is of somewhat rare occurrence. However, when it does appear great damage is often done.

Symptoms.—The disease is characterized by a wilting and rapid killing of young leaves. Affected leaves show brown spots on the upper surface not unlike the blotches produced by other fungi, but on the underside of the leaf the pathogene appears giving the leaf a somewhat mildewed appearance.

Cause.—Downy mildew of the rose is caused by the fungus *Peronospora sparsa* Berk. Unlike the fungus causing the powdery mildew, which, as stated above, lives on the surface of the host, this fungus works its way in the tissues of the leaf, only appearing on the surface to produce its spores. The spores which are borne upon special branches causing the mildewed appearance on the leaf are carried about by currents of air.

A scene in Netherwood grounds.

Control.—It is recommended that the houses be given plenty of air and the syringing of plants dispensed with. All fallen foliage should be collected and burned. Spraying with copper solutions and dusting with sulphur are said to be effective in protecting the plants from attacks of the fungus.

6. Stem Canker.—This disease occurs only on the stems and branches of rose plants. Both wild and cultivated roses are affected.

Symptoms.—Large irregular cankers are formed on the canes and branches. The disease appears first on one-year-old wood, its presence being revealed by small reddish patches scattered over the green bark. At a later stage minute cracks appear at the injured points and gradually continue to increase in size. The cankers are characterized by a brown centre with a black border, outside of which is a reddish zone.

Cause.—Stem canker is caused by the fungus *Coniothyrium wernsdorfiæ* Lanb., (probably the same as *C. Fuckelii* Sacc.). The spores of the fungus are formed in

minute black bodies in the diseased areas, which are visible with the aid of a hand-lens. They are probably disseminated by the wind.

Control.—The only recommendation that can be made for the control of this disease is to collect and burn all diseased canes.

There are other diseases of the rose concerning which little is known other than the causal organism. Among these may be mentioned bud rot, caused by the fungus *Botrytis* (species undetermined); Septoria leaf spots, caused by fungi of the genus *Septoria* (*Septoria rosarum, Septoria rosæ sinensis, Septoria rosæ,* etc.); leaf spot, a fungous disease caused by *Mycosphærella rosigena*; Brier scab, caused by the fungus *Botryosphæria diplodia*; Root rot, caused by the pore fungus *Fomes ribes;* and leaf spot caused by *Cercospora rosicola.*

Doubtless some or all of these diseases are of such importance that the life histories of the causal organisms should be worked out entirely together with methods of control. Although of somewhat rare occurrence great damage may be done when these diseases appear epiphytotically.

Our investigations are merely started and much remains to be done. The ultimate end and object of all plant disease investigations is control, and anyone who has suffered loss from a rose disease and has sought to find a remedy needs not to be told that our knowledge of rose diseases is limited. Most of the present recommendations for control of diseases of the rose are of a general nature. They are suggestions based on limited knowledge as to the most likely lines along which success is to be expected. Most of these suggestions need to be given a thorough trial before being adopted by growers on a large scale.

As stated before rose growers are materially aiding this work by sending specimens of diseased plants. Acknowledgment of receipt of the specimens is made and the grower furnished with available information and suggestions regarding the nature and control of the disease, no expense whatever being incurred by the grower. Not only is it desirable to obtain specimens from members of the American Rose Society but also from rose growers in general. Specimens will always be appreciated regardless of whether or not they are of a new or old disease or of economic importance.

The thanks of the Convention were tendered to Dr. Massey for his instructive address.

WINTER THOUGHTS ON GARDENING.

William Allan, Toronto.

During the last ten years I have not seen anything make such rapid growth as horticulture has done in Toronto and the neighboring towns. I have had the pleasure of going through a great many gardens, both big and little, and I can assure you that the greatest pleasure that I have derived was from visiting the small gardens of shack owners. A great deal of credit is due to the different Horticultural Societies and their secretaries and presidents for the interest they have taken in the small lot holders, and we should encourage them in every shape and form. I have a series of slides showing the principal and the rudimentary elements in gardening.

This slide represents the first step in gardening. I have repeatedly been asked what is trenching? And to show that in as simple a way as I can I thought the

best thing I could do was to have a slide taken of the ground in that state. People have different ways of gardening; some are content with just ploughing. I don't run down ploughing at all. I have seen excellent crops gotten out of gardens that were only ploughed, but I have seen better gardens that were dug nicely. But to have thorough success the ground should really be thoroughly well trenched every fall if you can possibly devote the time to it.

The next slide will show the ground complete. At this season of the year and earlier there are a great number of leaves. Just put them in the bottom of the trench and in the course of a year or so they will rot and that soil being turned up again the crops get the benefit of it.

This next is another photo of the ground trenched although it was taken about a month or so later. Now the question has been asked me repeatedly, how it was I grew beans between the cauliflower plants. The only reason was that between each of those cauliflowers we had two other rows of cauliflowers. So to utilize the ground and get the most out of it I thought the best thing I could do was to sow the beans.

The next slide is a view of carrots taken in a small garden. There are some vacancies there that were caused through carelessness, nothing else; but the unfortunate seedsman got the blame for giving an inferior seed. It was nothing of the kind. It was what I call purely and simply lack of intelligence. Now with the majority of growers, with carrots in particular, they are pestered with little yellow flies as soon as the seeds come through, and if you do not get rid of those and get rid of them quickly the result is a miss. With this lot here we got around them and we used whale oil soap, and the consequence was that I had an excellent crop of carrots, although I had a great many misses first. So instead of blaming the seedsman you want to blame the cultivator and if you will use whale oil soap in the infant stages you will have some excellent results.

This is a crop of lettuce and in the next lantern slide you will see this same crop thinned out, giving the lettuce sufficient room to grow and develop. In the first, second and third row you see the lettuce is just growing as thick as it could possibly come up and nothing done to help encourage the growth or to develop the plant and bring it to maturity. Now what I call good lettuce is when the lady of the house or anyone goes out to cut them, and they naturally hesitate cutting such "beautiful heads." The growth is magnificent and it is no wonder. It is a great mistake that a lot of people make, they are content to sow the seed and leaving the lettuce plants or any other plants just to take care of themselves, and not go to any trouble to thin them out.

This is a celery trench. The celery is on the left here and beans on the soil that we got out of the trenches. The space between is 5 feet 6 inches. You might just as well utilize that ground by growing beans. In a crop of lettuce you can take off a good lot of radishes. We are not content unless we get at least five crops out of that ground and we utilize the soil of the trenches as well.

That shows you lettuce growing to perfection and there is a picture that almost makes you say to yourself, "it is a shame to cut them because they are so beautiful." The lettuce are just as good as they look.

That is the trench again, dug out for the celery, which has been planted for two weeks. There are two rows of lettuce and the centre row is again beans. When those lettuce were cut the spinach was put in and then a crop of radishes. The soil was utilized afterwards for the celery.

Now this represents a bed just ready for planting. I am asked, "Why do you place the bulbs on the bed before planting?" If you have a bed and quite a number

of daffodils to put in, and you don't know exactly the space that they take up, the best thing you can do is to place them on the bed. In this case we had ample time and we wanted to make the most of the daffodils. When daffodils have to be planted I would strongly recommend you to throw the soil off the bed entirely, then put the daffodils in and the soil on and you have the whole thing complete.

There is another thought here that is well worth mentioning. The gardens about Toronto and out of Toronto and all around us are well worth looking at, but we have such a terrific spell of snow and winter. It would be worth having the different members of the Association take up with their local members the growing of bulbs in the winter. Anyone can grow them, it is as simple as A.B.C., and you don't want a well regulated greenhouse. You don't want to go to any unnecessary expense in the cultivation of them. The whole thing is to get the bulbs planted, cover them up and put them in the corner of your cellar, anywhere, or you can put them in boxes, cover them up and leave them outside in the snow. You can let them freeze through as much as you like. You can take them into the house a solid block of ice and put them in little pots or anywhere in the spring and they will thrive nicely.

I knew a gentleman in Toronto, and he knew as little about bulbs as they knew about him. He had a showing of daffodils last spring that would have been a credit to Sir Henry Pellatt's garden. He followed up the principles that I suggested and put them into boxes outside. It is not too late yet to get bulbs; they are very cheap, and as soon as you see the little white tips down in the cellar, gradually bring them to the light and so on until the growth is complete. It is certainly a great pleasure and it is an interesting and instructive hobby to go into. Just put them outside until they are thoroughly well rooted, let them freeze through and then put them into the pots.

Here are some Darwin Tulips. So far as the Darwin Tulips are concerned they are very well worth growing and are very handsome indeed. Dr. Clark is going to speak to you on the tulip and I can assure you it will be a treat well worth listening to. This is one of His Royal Highness, the Duke of Connaught's favorite flowers. He did not think we could grow such tulips in Canada. I told him we could grow tulips and almost anything else. He also commented on the appearance of Toronto, and nothing seemed to please him more than the well-kept lawns in and about the small houses and the little gardens too.

That is another variety of the Darwin tulips, and you will have the pleasure of seeing the Duke and Sir Edmund in the next slide admiring the tulips.

Those are some of the finer varieties of daffodils, well worth growing, and they can be brought to perfection with very little trouble.

That is another of the daffodils. Those are little things that anyone can grow. You will see them in the next slide. That is one that they call the Sulphur Petticoat, it grows about 5 inches high and it is one of the earliest daffodils. If you plant them in the month of September you will have them in full beauty by Christmas. When the daffodils have done flowering is the time that they want your kindest treatment. Unfortunately, with a great number of people, that is the time that they get the worst treatment. Well it is a great mistake you make. Now to get daffodils and to get them in perfection you want to manure them after they have done flowering; in fact do that with almost any kind of plant in the way of perennials, biennials and that sort of thing. Take pæonies, for instance, they respond to that too. With daffodils it makes a great difference to the size of the bulb.

Here is another grown in boxes—the Von Zion. They were planted as thick as we could get them into a box. They were just allowed to root and root thoroughly and then put into the cold. When that box was brought in there was more than a foot of solid ice on the top. But then to judge from the flowers now you would think they had been in comfortable quarters the whole season through.

This is a rather peculiar slide, but it has a very interesting tale. When you look at that and carry it in your mind's eye you will agree with me that it is about the most hideous fence you have ever seen. When we went up to take that view I thought the gentleman with the camera was going to throw it at me. When you see that same fence taken in black and white you will not recognize the old barb wire or anything about it, but I can assure you that the gentleman who covered that knew no more about tomatoes than tomatoes knew about him, and he had a most successful crop for the last two seasons, and he has had quite sufficient tomatoes off that to keep him and his family the whole winter through.

Pyrus Floribunda.

That is the same fence taken in black and white. He took that himself. I was rather interested and I had it developed. It was certainly commented on.

In the next slide we have the same fence taken in natural colors, and you will all agree with me that it is very healthy looking, and I can assure you that he had some of the finest fruit you have ever seen. One of the clusters in particular weighed at least 4¾ pounds.

The next slide was one I had taken at Hamilton and that shows the yellow tomato. An old gentleman grew it and it was the finest fruit I have ever seen. The great objection to yellow tomatoes is their appearance, but of the three tomatoes —the pink, the red and the yellow, the yellow is certainly the finest in flavor. His garden is not more than 50 feet long by 25 or 26 feet wide.

Now I have often been asked how to grow winter salads. Anyone can grow them. It does not matter what kind of box you get. All you have to do is to prepare your soil in it and allow about ½ inch from the top of the soil to the top of

the box. Water them and cover over, and leave for three days and you will see them growing up; as little leaves develop, gradually bring to the light, and with a little perseverance you will be able to have salad the whole winter through.

Now this is another view that is taken at Sir Edmund Osler's. That was considered by the Duke of Connaught one of the finest pictures he had seen for some considerable time. This beautiful border contains Azalea Mollis in the foreground, with Berberis Thunbergia, and with a background of Spirea Van Hout. That really was very striking, but the unfortunate part is that the Thunbergia with the majority of growers is ruined. I think a lot of those shrubs, particularly the Spirea Van Hout. People are too fond of clipping with the ordinary shears and destroy the shrub.

That is the same view taken in the fall. They destroyed that by clipping. Now the Thunbergia has a most peculiar tint of green in its young stages, and, in the fall, the leaves turn a most beautiful shade, almost crimson and after the leaves fall you have the berry. But some people have a great habit of cutting it and making it as level as a billiard table. The same with Spirea Van Hout.

People could put a tray on their shrubs and enjoy their afternoon tea. I have been asked by several how it is that these shrubs will not flower. For the simple reason that they were, in plain English, butchered. That is one reason why the delegates should impress upon the different members of their Associations to treat the flowering shrubs with care. If they do not know how to go about it, it is a very simple matter to come to their secretaries for advice, and I am sure it will be given to them.

Here is a glimpse of a perennial border. It would be a good idea if the officers of the different societies explained to the members the difference between perennials, annuals, biennials, and hardy annuals. I have had people come to me telling me that they would like to get a few packets of perennials' seeds and they had no objections if they were mixed with few annuals. Did they really know what perennials were? They were going to sow them in as a border as you do mignonette. That is very disappointing to people who take an interest in them, and from what I can gather from a great many of the different places that I have had the pleasure of visiting the majority of people want a little encouragement, so, when you visit their gardens, go in and admire certain flowers. Don't tell them you have far nicer than that at home. You can admire them without hurting their feelings. I have had people come and tell me that I did not know how to grow certain things, "Well," I said, "perhaps I don't, but if you can show me I am willing to take lessons." But it is certainly one of the greatest mistakes that people make when they order perennials when they want annuals. I do not for one moment say that there is anyone here to-night who does not know the difference, but as horticultural work is in its infancy a little education will not do any harm.

This represents another little perennial border, and we use Celosia and Petunias and the different Cannas. Miss Blacklock is going to speak on perennials, and I am sure that there is no one who can give you a better talk on perennials than she can, and I can assure you she has excellent taste and the flowers she has grown would do justice to a table in any house in England.

This shows the Pæonies. These will respond to treatment after the flowering stages, and if you only look after them as soon as they have done flowering, just giving them a little liquid manure occasionally, you will reap the benefit next spring. As soon as the plants have done flowering thoroughly feed them with manure, at least six or seven times.

That is another peep into the same border. I introduce annuals here. A great many object to the introduction of annuals, but I think nothing looks better in a perennial border than annuals. However, it is just a matter of taste. The reason for the introduction of Darwin tulips in 5's or 10's or 15's in the size of this border is this: When the perennials are growing you get some beautiful tints of green, some light, some dark, some mahogany color, all shades, and with the bright colors of the Darwin tulips coming up between those leaves you have something very beautiful indeed.

That is the same border with lilies thrown in and the single tulip and pæonies hold a very important position there.

Now that is an Azalea Mollis, a plant that is perfectly hardy, although I would recommend that it be planted early so as to get rooting action. Once they get hold of the ground they stand any amount of frost. Now that plant is ten or twelve years old and has never disappointed me once during those years in flowering, but of course I see that it is well looked after. I give it a little leaf mould occasionally, and by watching it carefully you get the results.

There is one peculiarity about that pæony. It is almost impossible to get near it, the bees lodge there in thousands. What it is that attracts them I do not know.

This is another piece of the border as well, showing two rows of Alyssum with a row of Acaranthus in the middle.

Now this is the Rock garden and it is very gratifying indeed to know that so many are taking an interest in the rock work, and it is one of the most interesting forms of gardening that anyone can undertake. The great secret of that garden is the formation of the stones. Some people put them in so close that it is almost impossible to put the point of a walking stick between the stones.

The next slide shows the Rock garden in full bloom, and we generally leave an open space on top which can be filled in with some flowering plants such as dwarf growing Petunias. With rock gardening, of course, you can introduce small daffodils, many of the tulips and that sort of thing, and they will not interfere in any way with the growth.

With that big box of Phlox Subulata in the foreground there is nothing so pretty as to see those tiny little daffodils peeping through the dense mass of growth. After the daffodil has stopped flowering the pink takes its place.

That is another plant that is very useful. When I came to Canada I was told that the hardy perennials did not survive our winter. I can show you plants that have been out for this last five years. They are only covered with the protection that nature gives them herself—a few leaves and I find that they do well, although I know of instances where they have died.

The next slide was taken in the spring when the daffodils and the different varieties of the Darwin tulip were in full bloom.

This is taken in the conservatory. In the month of March and April we devote a great deal of space and room to the cultivation of the Darwin tulip and the different daffodils. They come in very great beauty, and they are easily grown, and all they require to get them to perfection is to keep them cool.

That is considered to be one of the finest plates that has been taken in the color process. The shading on top of the flowers, the purple is pretty hard to get better. The man who took this photo is now doing his little bit out on the front. He has been wounded, but has got into a very good situation now in the War Office at London.

Gloxinias cannot be grown by the amateur growers, but no plant that I know will respond better to good treatment than the Gloxinia. If you give it something that it likes it will smile and respond as this one has done.

Now that is one of the Old Country's varieties of grapes. I have been asked by eminent growers in England, the producers of some of the finest grapes grown in that land, what my thoughts are with regard to grape growing in Canada. I had to confess candidly that I have grown most of the grapes in the Old Land, and I have grown them out here, and I have never tasted finer grapes and never grown finer ones than I have grown in Canada. I do not attribute that success to myself. You do not get the sunshine in England and in Ireland and in Scotland that you get here, but at the same time where you get the sunshine here you have a great deal to contend with, such as mildew, spiders and all the different little pests, more so here than in the Old Country, but with careful study and careful management and a little extra trouble you are certainly well paid for all the trouble.

Photo: W. A. Child, M.A.

Where garden meets the woods.

There are more failures in mushroom growing than in anything I know of. There is no difficulty whatever in producing them. It is just knowing the little ins and outs of the thing. With the majority of people those are grown just in ordinary boxes. In a box 3 or 3 feet 6 inches long manure was put in and that is the consequence. The depth of the manure that was in that box was about 10 inches, including soil. With careful management you can get at least five crops.

If time would permit I would go into mushroom growing in detail. A lot of growers, when they are successful with mushrooms, keep all the little secrets to themselves. In the vicinity of London I have asked the growers to let me see their beds. But they would not let you look into them or say anything about them. I have grown mushrooms for a number of years and I have had great success and some bad failures as well, but I put the blame not on the spawn but on myself. You can get them to the size of little peas lots of times and you see no more of them, and that

is the trouble. Perhaps at some future date I may have the pleasure of going into details.

Those are some Chinese Primulas. That plant is two years old. We have had those plants measure 4 feet 6 inches across, and some 3 feet in height. One gentleman said he had some magnificent ones 8 inches in diameter. It is just in the feeding and in giving them the proper nourishment. Most plants are like ourselves: you give them something to eat or drink that they dislike and they will show it. The difficulty is finding out their likes and dislikes. Unfortunately with a great many plants if you give them the wrong thing the plant is done for. The great secret of success with plant growing is to study your plants and find out from personal experience how to treat the different subjects, and if you do that you will have no difficulty whatever in producing what your heart desires.

Those are some Begonias. Alamanda in summer is a very handsome flowering plant, yellow all around and darker in the centre. It will respond to treatment and bloom the whole season around. But to grow them in beds they have to get attention. In this particular photograph it has responded this year beautifully. Unfortunately we have the chrysanthemums in the house and if we want the chrysanthemum to grow we have to let the other go.

COLOR SCHEMES FOR FORMAL FLOWER BEDS.

Richard Marshall, Toronto.

Softness without melancholy and brilliance without glare is an eloquent definition of a summer morning. Such would also be an appropriate description of a well-managed and properly grouped flower garden. For the last few months a perfect deluge of beauty has been sweeping its enchanting course over the surface of the world. No one can help being amazed at the power which could thus, in a few weeks, by means which none can perfectly understand, enwrap the universe in a rich robe of varied glory. All the endless varieties of soil and climate from the regions of frigid snow to those of burning sands have their own peculiar vegetation, staining the snow with a blood-red color or relieving the arid waste with a sprig of green moss. But, while the whole earth is covered with beauty each garden should be a focus concentrating into one ardent beam ten thousand convergent rays not, however, to dazzle by their brightness or offend by their gaudiness, nor puzzle and perplex by their inexplicable kaleidoscope-like confusion, but to satisfy by intrinsic beauty, please by their charming variety, and tranquillize by their harmonious congruity.

To have a well-formed and nicely filled garden is not enough, it must be also nicely arranged. The latter is of far more importance than the former.

I yield to no one in admiration of beauty and form; it is of the first importance that the outlines of the beds and their relation to each other should be good, but it is of much greater importance that the colors with which they are filled should either harmonize or contrast with each other. It is much easier to learn this by actual observation in the garden than anywhere else, and September is the very best month in the whole year to study the theory of effective grouping as illustrated by actual practice.

Everybody who has the opportunity should visit the best garden to which he can find access; pencil in hand those combinations of colors that strike you as most

effective should be carefully noted down as well as those that are not effective; the former entered as examples to be imitated, the latter as warnings to be shunned.

Try also to engage in conversation with the gardeners where you visit and draw out their reasons for certain combinations. They are generally so generous and good natured that in ninety-nine cases out of a hundred they will give you, with free good will, information in a few minutes that it has taken them years to acquire. The whole principle of effective grouping is based upon the fact that all colors are more or less beautiful when placed in certain relationship to others. Flowers are very much influenced by their neighbors. It is not good for them to be alone; but infinitely better to be alone than in bad company; good congenial society brings out their best qualities. All colors are strengthened and improved by harmonious contrast and proper blending together. Certain flowers, when placed contiguously, appear to intensify each others' depth; others equally beautiful in themselves lessen or destroy each other's beauty when placed in juxtaposition. Hence has arisen the necessity of blending and arranging colors upon some generally received philosophical principle. The nature of the ground, shape of the bed, style of the garden, character of the surrounding trees and shrubs, extent and size all exert an influence upon the proper quality and quantity of color to be introduced; the character habit and time of flowering of the plants used are also points of the utmost moment and the best arrangements are often marred from inattention to these matters. I will now lay down some of the elementary principles and give some examples of effective arrangements.

It is well known that there are only three primary or simple colors, red, yellow and blue, and they are most effective when placed in the order in which I have named them; but if a wafer of each of these colors be placed on a sheet of white paper it will appear in a few minutes to be surrounded with a ring of different color, and the color thus formed is called a secondary compound or complementary color and always looks well placed in juxtaposition with the primary color producing it. Placing a red wafer as indicated, it will appear surrounded with a circle of green. In the case of blue the circle will be orange. With a yellow the border will appear purple. Therefore, purple, orange and green are the complementary colors of yellow, blue and red, and always look well placed beside them. Orange is the complementary of blue, greenish-yellow of violet, indigo of orange-yellow and of course *vice versa.*

In practice white generally takes the place of green, a green bed seldom or never being advisable except in scroll work or in a very small bed on bright red gravel. These contrastic colors to the primaries produce harmony in opposition in the same manner as in music by grouping orange with blue, purple with yellow and green with red. This neutralizing or compensating power is the foundation of all agreement and harmony amongst colors, and upon it depends the brilliance and force of every conception as to contrast of colors. It is found by experiment, and it may be also proved by fair reasoning, that whenever the eye regards two or more different colors at one and the same time the color of each is so modified that it appears by the contrast to be of that color which would be produced by the addition of itself to the complementary colors of the neighbors, and modification is greatest where the contrast is strongest and least where that is the weakest. When colors that are as nearly as possible complementary to each other are contrasted, the color of each is rendered more intense or its tone is deepened. This follows immediately from the general principle laid down and is fully confirmed by experiment. Colors, when contrasted with white, are deepened in tone, and at the same time appear more

brilliant, the white itself being tinged slightly with the complementary of the contrasted color. Contrasted with black colors appear of a higher tone or less intense and the black is feebly tinged with the complementary of the contrasted color; grey being intermediate between black and white produces an intermediate effect on colors with which it is contrasted. This is seen by the following results obtained by placing different colors in contact with grey ground.

Red and Grey. The grey appears greenish in consequence of its receiving the complementary of the red; the red appears purer, less orange color, perhaps.

Orange and Grey. The grey appears blueish, the orange purer, more brilliant, and perhaps a little yellower.

Yellow and Grey. The grey is tinged violet. The yellow appears more brilliant and at the same time less green.

Green and Grey. The grey is reddish and the green is more brilliant.

Blue and Grey. The grey is tinged with orange, the blue appears more brilliant and a little greenish.

Violet and Grey. The grey becomes yellowish, the violet purer and less dull.

When two compound colors having one and the same simple color common to them both are contrasted, the common color loses its effect in a greater or less degree. For example, take orange (composed of yellow and red) and green (composed of yellow and blue) their common color yellow being lost by the contrast, the orange appears redder and the green more blue. The complementary arrangement is superior to any other for harmony of contrast; to produce the best effect the color should be as nearly as possible of the same tone. White comes in best in the complementary arrangement of blue and orange and worst in a combination of yellow and violet. The simple colors red, yellow and blue combined in pairs go together better than one simple color and one binary color containing that simple one for example:

Red and yellow	harmonize better than	red and orange.
Red and blue	"	"	red and violet.
Yellow and red	"	"	yellow and orange.
Yellow and blue	"	"	yellow and green.
Blue and red	"	"	blue and violet
Blue and yellow	"	"	blue and green.

In an arrangement of one simple color with one binary color containing the simple one the brighter the latter is when compared with the former, the better the contrast, or, in other words, in arrangements of this sort the tone and intensity of the simple color ought to be lower than that of the binary color. For example:

Red and violet	contrast better than	blue and violet.
Yellow and orange	"	"	red and orange.
Yellow and green	"	"	blue and green.

When two colors harmonize badly they had better be separated by something white. Black associated with dark colors such as blue and violet or with bright colors with a deep tone produces harmonies that often have a good effect. For example, an arrangement of black, blue and violet is better than one white, blue and violet, the latter being too violent. Black with two colors one bright and the other dark is not so good as when the two colors are both light, and in the first case the brighter one of the colors is the more the effect produced. Thus in the following arrangement black is inferior to white:

Red and blue	Orange and blue	Yellow and blue
Red and violet	Orange and violet	Green and violet

When two colors harmonize badly they had better be separated by white, black or grey, but in so doing attention must be paid to the tone of the colors and to the proportion of light and dark colors. For example, as to the tone of colors the effect of white with red and orange is lessened in proportion as their tone is deepened. Black on the contrary does very well with the same colors at their normal tone, that is, when, without containing any black, they are as intense as possible Grey is not so good with red and orange nor does it produce so violent a contrast as white. Colors are also separated into cool and warm ones. The former should prevail in gardens laid out on gravel which is itself generally a warm color, the latter in those laid out on grass which is invariably a cold color. For instance, in gardens on gravel, grey, lilac, yellow, white, blue, and green should predominate; in those on grass, purple, pink, scarlet and orange prevail. White, however, is equally suitable for gardens of both descriptions, and, except where the gravel is very light,

Ornamental flower bed.

is always striking and effective, and nothing can well be more chaste and beautiful than beds with broad margins or lines of white near the grass. They present a striking contrast to bright red gravel. As a practical rule the most intense colors should be placed in the centre of the beds, and the less decided tints used for rings and edges. The smaller the beds the more liberally may the intense colors such as scarlet, etc., be used. Much exception has been taken to the present style of furnishing flower gardens on the ground of monotony or flatness of surface it induces. Some would be inclined to designate it a dead sea, and I must admit that it is often a level plain of beauty, but it should be borne in mind that smoothness and evenness of surface are one of the elements of beauty; besides, to enjoy beauty in masses the eye must be able to see it at a glance. Nothing must be so high as to intercept the line of vision and break up unity of expression and oneness of effect, compelling us to look at it in detail only. Every separate part of a garden like a

picture should be beautiful in itself, but all should appear subservient to the grandeur of the whole. Hence the superiority of the present to the old fashioned plan of furnishing the flower garden. It is not so much that we have more and better flowers although we have these, but it is chiefly that they are more tastefully disposed and better seen. However, those who desire more variety in the sky outline of their garden should plant recinus or castor oil plants for centres, and cannas, of which we have a great variety from eight feet down to eighteen inches. Those who have the large circular beds such as in Queen's Park cannot have failed to be charmed with this style. These, however, require great taste and judgment in their introduction, and are seldom effective or admissible except in circular beds. In pictorial arrangement variety of color is obtained by the introduction of different hues of the same color and of different degrees of brightness. For example, although it is proper to repeat certain colors as red, for instance, it is not necessary that all reds in a picture should be a bright vermilion color. On the contrary, the picture will gain in beauty if one should be a full earthy red, a third crimson and so on through all the scale of colors. Ribbon borders from six to twelve feet wide, planted with many distinct and separate colors as follows: dark blue, scarlet, white, black, blue, brown, and scarlet are generally the most effective for the greatest width here stated; perhaps they are most beautiful divided by a row of the tallest plants in the middle and both sides planted alike or different in color but similar in height, gradually falling from centre to sides.

PARTNERS WITH GOD.

Hon. Lieut.-Col. J. L. Hughes, Toronto.

I have spent most of my life teaching, and have observed its various influences on the child—on the child's morality as well as on the child's physical mind. I read more than forty years ago statistics to prove that eighty out of every one hundred of the leading men of America, in our Senates, Legislatures, Congresses, ministers, lawyers, doctors, merchants and bankers were brought up in the country. There were those when I was a young man, who went up and down the country, saying, "That was because of the little red schoolhouse." I had sense enough when I read that to know that it was rather what we got outside; we really got very little in the little red schoolhouse. It is what we got outside the schoolhouse which counted in the development of our character. I regret that in this country we are still, perhaps, as blind as in any other part of the world, and do not realize that knowledge never was power and never can be power until it becomes an element of the human soul. The point which develops the country boy is that he had three things in his favor: He had more play, more planting, and more productivity. I was a farmer myself until I was nineteen years and seven months old, and I know the splendid opportunity that I had for play. I played with the girls until I was thirteen, then I played with the boys and men. But play was one of the definite elements in my life. We did not let the girls play very much in those days, not nearly as much as now; but they need play just as much as the men, perhaps a little more. I decided forty-two years ago, that if I lived long enough, Toronto should have the largest playgrounds in the world, that we would have plenty of opportunities for planting and growing things, because that is how the child gets into partner-

ship with God. And that we did. Playgrounds and opportunities for growing things were furnished. I decided that we would also have opportunities for productivity. Manual training, etc., gives this to a large extent. For many years before I gave up the position which I held, the children of Toronto purchased through me more than 65,000 packets of seeds every year to grow in their own home gardens. That was stopped because it would take at least half an hour in a week to distribute these. We have about forty hours in a week; it would take one-quarter of an hour of those forty to find out from the children what seeds they wished to get, and then when the seeds were sent to my class, to give them out. But because it would take about half an hour at the outside, when a teacher was slow, it was discontinued. I am going to unite with the Toronto representatives if they will go with me, to get it back into the schools. I read once some statistics which said there were fewer gardeners in the penitentiaries than any other class, even including ministers. The man who co-operates with God to produce things like we saw to-night must be a better man for it. I do not know whether a garden would recreate a man of fifty who had been a reprobate up to that time, but I am confident that no other agency will lift one to God as much as does the garden. The little boy takes that little dead-looking thing of seed and puts it into the ground, no life apparently in it; by and by, if he gives it the proper attention, watering, etc., that little shoot which has sprung up grows to be a beautiful plant, and the boy knows that he did not make it grow alone. I would not say to him, "God did it," at this point of his life. He is too young. But he knows there is some big element in his life, and by and by, when he is old enough, the thought will come that he and God were in partnership, and that is the greatest thought any man can conceive.

I am not surprised that gardeners are good men and women—and the women of our country should be devoting more time to gardening. Their general tastes would be better adapted to it than a man's. Speaking of the moral side, when that little boy sees a plant in his garden that is fading, and he has been trained that when he gives it water, that will by and by produce those hanging arms, and by and by broad flowers, he will know that he and God were partners. Then into his life comes the apperceptive centre, and if our clergymen should talk for thousands of years, it will never have the same effect as this realization. It is pure Greek to them; it does not enter their life. There is no phase in their lives to which it may be attached, and so into that boy will come the apperceptive centre. That will help not only himself to a better and larger life, but every life that comes in contact with him. There are barren spots in every farm and every backyard in this country —miserable places. If I trained a boy so that he co-operates with God in making beauty in these barren spots, I am putting into his life the other consciousness. So if we had time we might dwell a good deal on the moral influence on the boys and girls, in training them to be producers of beauty in harmony with the divine laws that are around them. The boys in the cities need those three things—more playgrounds, more opportunities for planting things, and for the producing of things.

Too much attention is paid to mere school gardens. They are of no use so far as I can see, except to train the child to make a garden in his own home. The school garden is right, not as an end, but as a means to an end. And so I would have school gardens, but we must not be content with that. In the olden days in Toronto, the Horticultural Society presented medals for the best gardens cared for by the pupils of the schools. That also has been stopped, but it can be brought back if we unite for it. I know of men here who have done great work. A boy in the eastern part of the city had no soil on his garden, it was all sand. There

was a house under construction nearby, and the soil had been dug up for the cellar. He got permission himself to get the ground for his garden. He took a wheelbarrow, got the soil, spread it on his garden and planted his own vegetables, and he won the gold medal. He got the glory of power through his perseverance, but the consciousness that he had power to co-operate with the Divine was the wonderful thing that came to him. So we ought to have in our cities school gardens. Every home in the city should have a home garden. Those back-gardens, many of them, would be improved if they had flowers there. But we may do that, and still only be cultivating selfishness, because we raise flowers only for our own enjoyment. We need to watch that idea of selfishness in this country as well as in others. Selfishness of my own joy may be the start of my downfall. I want these boys to be trained to make the city and their district beautiful under the guidance of their trained teachers, under the guidance of the Horticultural Society, under the best guidance always. One of the most remarkable men in the world to me is John Patterson, of Dayton, Ohio. When he started his work in an old factory, he was practically bankrupt, to-day, after sixty years' work, he is worth $16,000,000. When I was there he had twenty-eight different departments of work for the development of the people of the district of Dayton. In the first place he got the man who laid out Central Park in New York to lay out the grounds around the factories, trees, vines; you can't look out of a window of the factory without seeing beautiful grounds. Remember, it was the poorest and the lowest district of Dayton, and he said, "I will make it beautiful." He said, "I will give any boy or girl all the plants they want, trees, shrubs, flowers, to plant in their own front and back yards, so that they may make this district beautiful." It became beautiful. I wish we had some John Pattersons here! We can raise the money some other way. The children will raise the money themselves. It does not hurt them. The greatest surgeon on earth sold papers in this city. I mean Dr. Cullen of Johns Hopkins University. He and Dr. Osler were the only medical men on this side of the Continent asked to speak at the last Medical Convention in Paris. As I said, the country gives eighty out of every hundred of the successful men of the world, and sixty-seven out of those eighty were so poor they could not go to school except in the winter. That absolutely shatters the old little red schoolhouse humbug. It was what they got outside in touch with Nature, in the necessity for duty and work that made them different men. These elements will be of more consequence to us than mere knowledge. They have these opportunities, they have the wild flowers.

I love wild flowers. I once had 236 varieties of them at Balmy Beach. One of the things I dislike to see is the children coming out of the woods in the spring with their arms full. What more exquisite picture than the hosts of trilliums, which grow in such profusion in the early spring. What more infinitely beautiful than a few of these flowers, and yet children go to the woods and bring in great loads of flowers and plants, and you hear parents say, "They love the flowers, and we want to develop that love." What is it developing? Destructiveness of things we love or ought to love. Is that good training? Pick little bouquets, but only a few. Never destroy the plant so that there will be no seed for next year. I wish that you could let the school inspectors know that you have and know something that will be good for the country. I am going to try in some way to arrange that the senior boys and girls in the city may see some of those pictures. I would like them to see some of these things that may be produced. Get some of the larger boys, one from each school or two, to go back and train their

fellows. Some people believe yet that boys prefer to do wrong to doing right. Those who still hold that belief must think God fights on the side of wrong. Boys love to help others. I think I see a way in which we can teach the boys in a school to help to make their yards more beautiful, the corners of their streets more beautiful, especially where we have the streets not at right angles, where there are little corners. But in the country, for the sake of those wild flowers, what could we do? I do not know many farms in the townships of this country where there are not a great many barren places and swamps. If they were mine I could make infinitely more money by growing orchids on them, from a mere commercial point of view. I could, if I cleared it up, cultivate certain sloping hillsides that

German Iris bordering a roadway.

you cannot plow. You never can grow much on them, but you could plant trees there. The Germans plant trees on their hillsides. They plant trees even along the cuts on their railway tracks so that you can touch them in going past on the trains. They plant trees all along the railroad tracks. Trees, so as to make shade for the flowers which are planted in between. This we can even learn from our enemy. I think it would be profitable if the boys were trained to produce beauty, for commercial purposes, if you will. Fifty years ago I knew where every flower within eight miles of Toronto grew. And not only flowers, but ferns. I had forty-eight different kinds of ferns. They are sold now in the city every spring time, but they dig them up and do not put others in their place. They will all be gone by and by. It will not degrade the flowers to use them for com-

mercial purposes, and those who are buying them are buying them because they are beautiful.

There are a few people in this country yet who say that it makes the boy effeminate. Some people are very anxious not to have their boys effeminate. Those same men would not admit that women were their equals. I would not, either, in many cases, because women are their superiors. But they say it makes the boy effeminate to make him interested in flowers. I never knew any man who loved flowers better than my father, and he never weighed less than two hundred and twenty-five pounds. He was the best runner and the best boxer in the county of Durham, and he was the strongest man in the north of Ireland. The strong man and the brave man, and the true man loves the flowers. Effeminate! There are people, not only in Germany, who thought England was soft, was effeminate. I have never been in any village in England where the front gardens have not infinitely more flowers, and the men come home in the evening and tend to them. In a good many places in England now, farms are rented out a mile outside of the city limits, and they give a section of it to every man who wants to grow his flowers and potatoes. I wish you would start them in your towns somewhere. The boys of the town have no chance of doing the thing for themselves, or for their own good, or for God. Give them a chance and help them. That is better than the public school, better than the high school in a great many ways, for their development.

And when the test came, those English flower lovers! Nothing in all history will surpass the record of the men. Contemptible little army, at first. Oh, but it is not contemptible now! So tell them that the British men love the flowers, the British women love the flowers; that the British men and the British women are self-sacrificing. More than 5,000,000 have given up their work to fight for liberty and everything that Christ taught us to value. Those men loved the flowers, but it had not made them effeminate. I think the Germans would have been glad if it had.

So I hope that we will get in the schools a deeper interest in the flowers, as an agency for developing moral purity; and, of course, exercise gives physical power, and that we may have these provided for our boys and girls, perhaps by the nation itself. When God made us He made us in harmony with everything beautiful. Education ought to restore the lost harmony. Up to very recently education made the lack of harmony more intense.

Dr. F. E. Bennett: Mr. Hughes has spoken of the influence of flowers. I have tried to preach it, but I cannot express myself as the Colonel does. He spoke about influence and environment. We plant flowers all around the streets of St. Thomas—25,000 tulips on the streets this fall—and there will not be a tulip picked unless it is by a little child who does not know any better. All they have to do is lean across and pick them, but they do not do it.

Wild flowers are a hobby of my friend, Mr. Finley. We are going to plant them in the woods. Some were planted in the ravines. The children are growing to respect those flowers, and not destroy them. There was another point about giving flowers away. I do not see how people can grow flowers and keep them for themselves. It is not what you do for yourself, it is what you do for others that counts.

We cut all the flowers from our municipal greenhouse, thanks to the City Council and Mr. Fallon who grows them, and give them to the hospitals and the different patriotic societies. People who did not seem to appreciate flowers are

now joining in with our work, and are creating that spirit of floriculture, and it is altering their characters. I do not care how low they are. I can cite you instances of men in our town who spent their evening hours away from home, and to-day they are as enthusiastic about flowers as I am.

Now there is another point that also struck me in Mr. Hughes' talk. People will say, "War time is on, you had better drop the flower game." I will never forget the day that the 91st Battalion left St. Thomas. Man after man came to me and said, when we come back, have the old town a blaze of flowers. When we appealed to the Council for a grant, they were a little opposed to the movement, and I remember the chaplain of our regiment got up, and if any man ever made a plea for the growing of flowers that man did, and he was ready to go to the front, and he said, "Keep the work going." When you get men who are enlisting and who want to see the work continue, they surely must know what they are talking about. Now that the war is on, and the younger men are being slain on the battlefield, a new generation is springing up, and I think it is up to us to educate that generation up to the very highest ideals, and nothing can do it better than flowers.

J. Brown: This is the first time I have visited one of these Conventions, and I have heard a great many good things. It was worth my while to come from Kingsville to hear Mr. Hughes and see the pictures. I am glad that he paid the compliment to the boys that he did. We have been educating the boys in Kingsville to observe the flower beds on our street corners. I was some time ago digging up one of our corners on the street and putting in tulips. A strange business man was in the town, and he said, "I never saw anything like it before. Don't the children destroy them?" I said, "No, any boy who does not know the rules here and attempts to touch a flower would have a half dozen on his back in a minute." There were a lot of children standing around, and they were pleased that such confidence was shown in them. Our teachers try to educate them along these lines, and it is entirely changing the natures of those boys and girls. Only a few years ago I was the only one who had a bed of tulips. It created such an impression, that this year the citizens of Kingsville have imported 16,000 tulips, and, with the exception of some damage done by dogs, we never have a bed touched, and they are most beautiful. I was going to speak on vacant lots. We are going to try and cultivate those, and give them to the boys and girls in our school, and I believe they will have a better appearance than they have at the present time. Now there is nothing that gives me so much pleasure as for little girls to come to me and say, "Mr. Brown, can I have a few flowers for my teacher?" I let them pick them themselves. I have more pleasure seeing little children go out with my flowers, so that this year I put down about 5,000 tulips to give to the children.

THE BOY SCOUTS AND HORTICULTURE.

Joseph Garfield Gibson, Toronto, Commissioner attached to Provincial Headquarters.

All of us have, or ought to have, a hobby, and Scouting is the one hobby above all others I have in which I am specially interested. I am also interested in those objects which are the aims of your organization.

The first and earliest recollections I have of Horticulture take me back to a certain beautiful Sunday afternoon of my youth, when, after being well scrubbed and washed, I was started off in the direction of Sunday school, there to receive

religious and other inspiration. But sometimes about the end of April, when the warm rays of the spring sun were beginning to make the fields green and the birds were singing, I would feel a call to go elsewhere, and soon would find myself, not beneath the roof of the old church, but in the woods just over the hill from the town, where something told me the wild flowers were in bloom. I can recall how hard I would work in order to take home a large offering of flowers to ease off in a measure, if possible, the consequences of having skipped Sunday school. Sometimes it worked and sometimes it did not. They say that we have to give an account later on for all our operations down here, but somehow or other I do not feel that those afternoons will be charged up against me. Something in the woods and flowers seemed to attract me, and I really believe that those hours spent with Nature did me just about as much good as sitting in a stiff seat in Sunday school, with a stiffer collar, and wishing all the time for the benediction.

Other recollections of Horticulture are not quite so pleasant. They bring back the early hours of half holidays, which I was compelled to spend with a hoe, in the old garden at home. At those particular times my interest in the potatoes which I was hoeing was very low.

But you want to hear something about the Scouts. At the commencement let me say that those of us who are interested in this movement, including your worthy chairman, firmly and absolutely believe that it is the one boy's organization above all others. I might add just here that I could give you some very interesting incidents in the life of our chairman, which, if his parishioners heard, might result in his being churched. However, I am a Scout and a Scout never tells.

I believe ours to be the one boys' organization above all others, because it is the boys' own organization. The average boy, and he is the chap we have to deal with, is not specially enamored of school. He attends largely because he has to, and plays hockey as often as he can, consistent with safety. The same applies to Sunday school. The average boy attends Sunday school because he has to do so, and the same with church unless it happens to be one of those occasions upon which refreshments are being served, and then he needs no special urging. Thus you see in these places you have the boy under control because he has to be there. Even in the home the lad is not always himself, for even here he is hedged around by restrictions. But get the lad out in the great world out of doors, and you have him in his own element. Here he is absolutely at home, and here you get the real article, the real boy. Now our organization takes hold of the boy out in that world of his own and organizes him in connection with his play and his work.

Speaking of organization, every boy likes an organization of some kind. I remember some years ago, as a lad at home, a number of us saw a parade of some lodge. The members were all bedecked in their regalia. Home we went and organized a lodge, and clothed ourselves in regalia which, I am sure, was the envy of both the Orangemen and the Knights of Columbus. That desire is in the boy, the desire to belong to something.

All of you, I am sure, can recall long summer afternoons spent rather aimlessly at the old swimming hole, half holidays in the woods and similar expeditions. We enjoyed them, they helped us. I am sure they did; but those hours were spent without any guidance and without any special object or aim. Now the Scouts take hold of a boy at the old swimming hole, and teach him how to swim and how to handle any of his comrades who are hauled out of the water more dead than alive. The Scout officer goes with him on those rambles in the woods and instructs him as he rambles along. He is taught there how to cook his own meals and

generally to take care of himself. This, I am sure, you will agree with me is extremely helpful.

Then it is the boy's own organization. He helps to run the show, and that is just what the average boy likes. In a well-organized troop the older lads practically conduct its affairs. We have in each troop a Court of Honor. This is the Scout Master's cabinet. Positions on this court are enviously sought after by all the lads.

The movement was first established in Canada some six or eight years ago. It caught on at once. Many said it would not last, that it was a mere fad that would flourish for a while and then die. But this idea, like a lot of splendid other ones, came to us from old England over the seas, and they have a habit over there that, when they start a thing, they stay with it and see it through; just as they are going to do with the great struggle now on hand.

A sheltered fruit garden.

At first we heard some objections to Scouting. Some said it will take the boy out of the home. Well, you cannot keep him there anyway. He will go out. Show me the boy who spends all of his time in the home—and here I say it is the most sacred place under heaven—and who does not get out with the other lads and rub shoulders a bit with the world, and I will show you a lad who will have rather a rough time of it when he has to go out and when the old home can shelter him no longer.

It was also urged that we were in league with the army, and that the aim of the scheme was to make the boys into young soldiers. Well, we do instruct the boy how to walk along the street decently and to hold up his head; we do teach him how to do a little ambulance or first aid work, and this latter is very handy to know and very useful often in the home or shop, and we take up certain other features of work along the same lines as adopted in the army; but all of this is helpful to him in after life. Our chief aim, however, has been to make the boy a better citizen, and at the same time, if it should ever come that our lads of to-day

have to shoulder their muskets and march out to defend their homes, this instruction they received in the Scouts will not hurt them. As an evidence of this we have hundreds of our older Scouts, ex-Scouts and officers now in the Canadian army, and officers tell us that they are among the best soldiers they have. They know how to look after themselves in the field. Almost every day letters come to my office from lads over the Atlantic, and one and all speak of the splendid help their Scout experience has been to them. The Scout can look after himself.

Now I am going to tell you something about the lad's initiation into this organization. It is not a secret society, so you may all hear how the initiation is conducted. I shall never forget the first occasion upon which I witnessed it. I was out having a stroll in the woods and came upon a troop of Scouts formed up in the shape of a horseshoe. In the centre was the Union Jack, at the open end of the horseshoe was the officer in command and the recruit. The lad had his hand held up and was repeating after the officer what I afterwards learned was the Scout oath. I need not give you all of that oath, but I shall never forget the last clause of it. In this clause the recruit promises to do a kind act to another every day. I really believe that the lads make an honest effort to live up to that oath. I firmly believe that that clause of the Scout oath contains just about all there is in our true religion. I care not what a man's creed is nor to what church a man belongs, or even if he belongs to none, if he spends his life in the interests of the other fellow, then I believe that in the last analysis he will come out all right.

If I had the time I could tell you of scores of incidents where Scouts have lived up to that oath. Only a few days ago we heard of a case in a small town east of here, where an aged woman was being looked after by the Scouts of the town. They split her wood, do other odd chores for her around the house, and generally look after her and furnish her with eatables as she requires them. I think I have given enough to let you have a general idea of the movement.

I am to speak to you on "The Boy Scouts and Horticulture," and, in order to show you the relationship which exists, or which I think might and hope will exist, between the two organizations I will explain to you in as few words as possible the actual operation of a troop of Scouts.

Established in most of our towns is what we call a troop of Scouts. This body of lads is under an officer called a Scout Master, with one or more assistants under him. The lad enters this troop at the age of eleven or twelve years. Immediately he starts in on a course of instruction along the lines laid down by the regulations. In due course he has examinations or tests, and if he stays with us long enough and displays sufficient application becomes in the end what we call a first class Scout. I need not explain the various steps leading up to that degree, but at each stage he has an examination.

In addition to this regular course and the examinations which every Scout has to take, we also have some half hundred optional subjects. These he can only try after he becomes a second class Scout. These include such subjects as ambulance or first aid work, carpentry, shooting, cooking, study of the stars, engineering, electrical work, and several others of special interest to-night.

It is in connection with this special work that I think we might have some co-operation with your organization. It must be quite evident to you that the average Scout officer could hardly be expected to give instruction in all of these lines, and here is where I think some of you might help us.

Assistance, too, is specially needed at this stage. I told you that hundreds of our older Scouts had enlisted and were with the army either across the water

or in the camps here. This applies also to our officers. Many troops are without officers to guide them. If these splendid chaps are over the water helping in the great struggle and fighting for you and me, surely it is incumbent upon those of us who are at home to see to it that their work does not suffer during their absence. We should work, and I think work hard, so that when, in the providence of God, they return, we will be able to hand over their work to them, and they will see that their interests have not suffered.

Now among these optional subjects are some of special interest to your organization and in connection with which I think you can give us some valuable assistance. The first I shall speak of deals with the trees, the forests and the woods. To get this badge a lad is required to:

1. Identify the principal native tree species in own locality, and explain their principal distinguishing characteristics.
2. Identify five kinds of shrubs.
3. Describe the principal uses of ten species of Canadian woods. Visit a wood-using factory, if practicable.
4. Explain the aim of forestry, and compare with agriculture and unregulated lumbering.
5. Tell what are the effects of fires on soil, young forest growth and mature timber; principal causes of forest fires and how best to overcome them; three general classes of forest fires, and how to fight each.
6. Describe how the forest lands are protected and administered in your province.
7. Describe the general features of a lumbering or pulpwood operation; how the cutting is done in the woods; method of transportation to the mill, and of manufacture there. Visit some portion of woods operation, or saw-mill, or pulp or paper mills, if practicable.
8. (*Optional.*) Discuss one or more of the enemies of trees, such as insects (leaf-eaters, bark-borers, wood-borers), or decay (fungus diseases), and tell something of how damage from these sources may be lessened or overcome

It must be obvious that the average officer might not be able to instruct his boys in this particular line, and would greatly appreciate the assistance of some of the members of your organization. This is a subject of vast importance to Canadians at this stage. I am counsel for a corporation which has large lumbering operations in the North, and I know that this question is acute. It is highly important that the youth of to-day receive some instruction along this line and we ask your help and co-operation.

The next I shall speak of is the Gardener's Badge. To get this decoration a Scout must dig a piece of ground not less than 12 feet square; plant and grow successfully six kinds of vegetables or flowers from seeds or cuttings. Know the names of a dozen plants pointed out in an ordinary garden, and understand what is meant by pruning, grafting and manuring.

Now here you can give us much help. We have here in Toronto a couple of splendid organizations helping in this direction with respect to vacant lot work, but they do not specially reach the boy. The average lad dislikes working with the hoe, but give him a small plot of his own and tell him that if he gets certain results he will receive a decoration for the sleeve of his Scout shirt and you at once put a different inspiration behind his efforts. Here you can give us splendid help. I need not suggest how; I am sure it is obvious.

Next we come to a most interesting subject and we give a decoration to a boy who complies with the following:—

Must make a collection of the leaves of thirty different trees—or of sixty different species of wild flowers, weeds, ferns and grasses—dried and mounted in a book and be able to name and recognize them correctly.

Or, alternatively—

Must make colored drawings of twenty flowers, ferns, weeds or grasses from life, or twelve sketches from life of animals and birds.

Or, alternatively—

Must be able to name sixty different kinds of animals, insects, reptiles, or birds in a Museum or Zoological Garden, or from unnamed colored plates, and give particulars of the lives, habits, appearance and markings of twenty of them, chosen by himself.

Or, alternatively—

Must describe the habits and recognize by their songs, calls or voices of thirty different kinds of birds or animals.

This is a most interesting field and one where you could render us splendid help. Short talks with the lads either indoors or afield would, I am sure, be interesting and helpful to the lads.

Another direction where we could have co-operation between your members and our Scouts is in the care of the streets and squares of our smaller towns. The average square in the average small town is hardly a thing of beauty. Working under your guidance I am sure our lads could help in this splendid work. Another point in this connection is that the average boy is liable to be rather hard on plants and shrubs planted in such places, but you give him an interest in the upkeep of the place and his attitude will change. This is only a suggestion, and I am sure that something could be worked out along this line.

I notice that you hold exhibitions. I am sure it would help us if you would put on a few classes open to Scouts or to boys of Scout age. This would encourage the work among the lads and would, I am sure, be productive of great good.

I have only been able to give you a glimpse of the work and operations of the Boy Scouts, but I hope that I have succeeded in arousing your interest in the work.

In conclusion, I am reminded of the words of our late Governor-General, his Royal Highness the Duke of Connaught, on the eve of his departure from Ottawa. In substance he stated that he hoped that after the great war was over there would come to our shores a large immigration of good, sound Anglo-Saxon stock, so that if in the years to come any difficulty arose we would present a united people, of one blood ready and willing to battle if necessary for the common cause of our country. But we do not need to wait until after the war; we can begin this good work now with the youth of to-day, for he is the man of to-morrow and in his hands will soon rest the future of the Dominion. Let us see that our boys are developed into good, sterling citizens, and I submit that this training cannot be better accomplished, or perhaps I should say helped, than by enrolling our lads in the Boy Scouts. I ask your help and greatly appreciate the opportunity of speaking to you on the subject. Look up the men who are engaged in this work in your locality and offer them a helping hand, and I am sure it will be appreciated.

In doing this you will find the work interesting, but what is more will be having no small part in building up in this western world a nation well able to stand up and take its part among the other nations of the world, but always, I hope and pray, inseparably connected with Old England over the sea.

VINES AND THEIR USES.

W. T. Macoun, Dominion Horticulturist, Ottawa.

To most persons born in the Old Land the word vine means but one kind of plant, the grape; but in America, all kinds of climbing plants are included in the word, and while it may not be quite correct to call all climbers vines, the latter word is more pleasing to the ear and, doubtless, that is why it has been so generally adopted in this country.

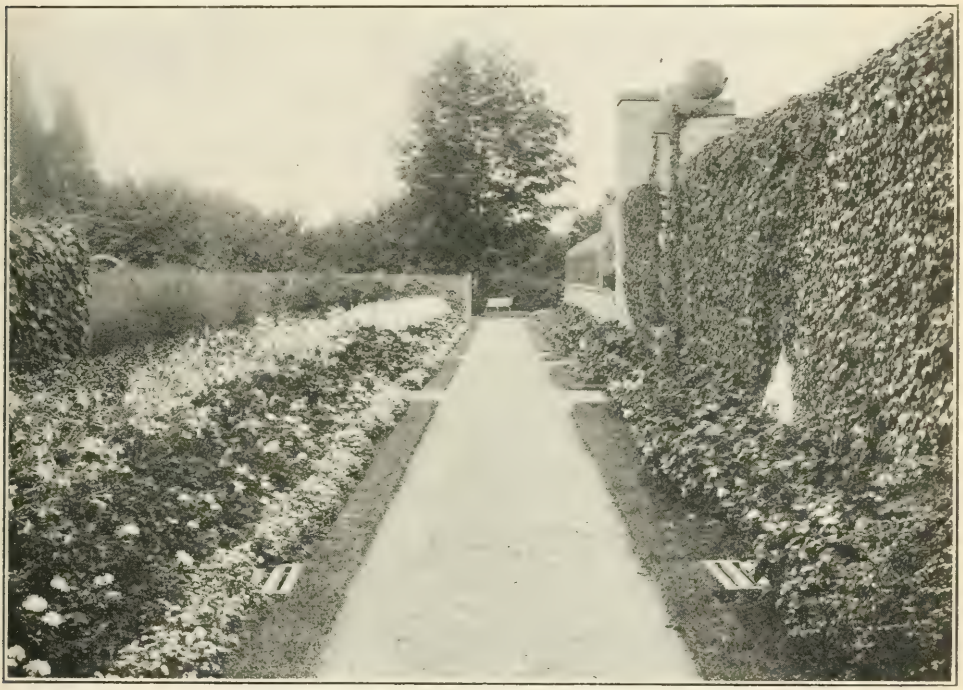
There is something in the vine-clad building or wall, the festooned pergola, and the verandah, porch, or summer house shaded and draped with good climbers that strongly appeals to one. Not only are they objects of beauty and grace, but they make a dwelling home-like, giving the idea of comfort as well.

There is nothing, in the writer's opinion, that so quickly and so cheaply improves the appearance of an unattractive or uninteresting or poorly-planned dwelling as a good climber. The hard outlines are softened, the building becomes more home-like and some shade for the verandah is quickly afforded.

Plants climb in various ways. Some, such as the grape, have tendrils by means of which they cling to any support which may be near. Others, such as the Japanese ivy and Virginia creeper, cling by means of discs at the ends of the tendrils. The prickles of the climbing roses help to hold the canes upright, although it is necessary, as a rule, to tie the canes up to make them secure. Clematis and climbing honeysuckles are supported by means of their leaves, the petioles of which twine about their support, while the main stems of others, such as the climbing bitter sweet, morning glory, and scarlet runner climb by twining. The English ivy throws out adventitious roots by which it fastens itself to walls or trees.

Perhaps the most popular vine in Canada, and in Ontario, is the Virginian creeper. It is a native of this country, is very hardy, and is easily obtained, which are three of the main reasons for its popularity; but, in addition, there is the glossy graceful foliage in summer, and the brilliant hues of autumn that make it attractive. The ordinary form climbs both by twining and by means of the tendrils, which work into crevices in walls of buildings. But although it is very suitable for verandahs, it is not satisfactory for covering walls as it is necessary to secure it to the wall in some way as the natural means is not sufficient; for although the tendrils are more or less provided with discs, these do not attach themselves securely enough. The variety known as Englemanni, a form growing in the Central States, has become popular in recent years, as it clings much better than the one usually met with. The tendrils of this variety are furnished with discs which enable it to cling much better than the ordinary Eastern form, and it is fairly satisfactory for walls; but in our experience it does not cling nearly as well as a certain variety growing wild in the vicinity of Ottawa, and, doubtless, in other places in Ontario. When the Central Experimental Farm was established in 1887, a vine of this form was found near the site of the Director's house and from this vine, and others found since, many vines have been propagated both from cuttings and seeds. All the seedlings cling as well as the parent plant, thus showing that it is a true variety. When this form was discovered the old descriptions of the Virginian creeper made by botanists were looked up, and it was found that it answered the description of a variety called by Don. *Ampelopsis quinquefolia hirsuta*, hence this name was adopted and we gave it the common name of "Self-

fastening Virginia creeper." It has smaller leaves than the common species, and while those of the latter are quite smooth and glossy, the self-fastening variety are downy and have not the glossy appearance of the other, though quite attractive, and in the autumn they color very highly. The tendrils of hirsuta are comparatively short and furnished with discs by means of which this variety clings very tenaciously to walls or fences, and requires little or no attention save when it reaches the eaves, when it should be kept cut off, lest becoming top heavy it should be pulled off in a storm. Another great advantage the self-fastening variety has over the other is in its freedom from thrip or leaf hopper. It may be that the sensation of the down on the leaves is not pleasant to this insect. The leaf hopper on the ordinary form can be controlled by thorough spraying with tobacco extracts such as Black Leaf 40, if spraying is begun in good season.



Garden view, showing walls hidden by Ivy.

Some years ago one was quite safe in calling the Virginian creeper by the scientific name of *Ampelopsis quinquefolia.* Then *Vitis quinquefolia* seemed the right name to use, but now we must say *Psedera virginiana* to be correct.

The Japanese or Boston ivy which, perhaps, deserves second place as a useful vine for the province of Ontario, is another plant which has had many scientific names. It was called Boston ivy because it was first brought from Japan to near the Arnold Arboretum near Boston. Some of the scientific names under which it has been known are *Vitis inconstans, Ampelopsis Veitchi, Ampelopsis Roylei, Ampelopsis tricuspidata,* and now it must be called *Parthenocissus tricuspidata.* This vine is well known, and needs no lengthy description. Its glossy leaves, its neat, attractive appearance, and its great powers of clinging tightly to a wall or fence, make it more desirable, for this purpose than even the self-fastening Vir-

ginian creeper, where it succeeds well; but it is not sufficiently hardy in the colder parts of Ontario. At Ottawa, for instance, there are few good vines, most of them killing back badly. If the Japanese ivy were an evergreen it would be still more valuable, but most of the evergreen climbers are found among the tenderer plants. One of the hardiest evergreen climbers is the English ivy, *Hedera Helix.* This is scarcely hardy enough even for the warmest parts of Ontario, but many persons have seen the fine specimen on the Village Inn at Grimsby, and others may be found at Niagara and Queenstown. It is rather surprising, considering how well these few vines are succeeding, that more plants of the English ivy are not found on the Niagara Peninsula.

Perhaps the different species of Clematis should come next in general usefulness, and while the large flowered varieties of the Jackmanni type are very fine, their success is too uncertain, hence we give to *Clematis paniculata* the first place. This attractive vine does not bloom until late in August or September, after other kinds have done blooming. During September it is a mass of small, white, sweet-scented flowers. While in Eastern Ontario it dies back considerably in the winter, it grows very rapidly again and blooms profusely. The virgin's bower, *Clematis virginiana,* the wild species which is quite common, is a very rampant grower with small, greenish-white flowers in summer, and is quite useful for covering fences. It makes a good vine for the verandah, though it is said to attract flies. The European species, which is somewhat similar to this, and which the nursery firms often supply, is the traveller's joy, *Clematis Vitalba.*

Anyone who has been successful in getting vines of the varieties of the large-flowered Clematis of the Jackmanni type established, or has seen them growing, knows the great beauty of these flowers. If they were more easily grown there would, doubtless, be many more of them; but, unfortunately, as is well known, there is a disease which attacks them near the crown of the plant which is destructive and no good preventive or remedy seems yet to be found.

The honeysuckles are charming climbers, the three most satisfactory being the scarlet trumpet honeysuckle, *Lonicera sempervirens,* the English honeysuckle, *Lonicera Periclymenum,* and Hall's Japanese Clematis, *Lonicera Japonica Halliana.* These are mentioned in order of hardiness, though none of them are entirely hardy at Ottawa. The scarlet trumpet honeysuckle blooms almost continuously from early in June until late in the autumn, the scarlet trumpet-shaped flowers being very attractive. It is, as its scientific name implies, an evergreen, though in the colder parts of the Province, the foliage is injured in winter. The English Honeysuckle or Woodbine, *Lonicera Periclymenum,* which is bright pink outside and yellow within, is deliciously sweet scented, the odor which is quite spicy reminding one of incense. It is not so hardy as the Scarlet Trumpet Honeysuckle, and at Ottawa does not usually bloom well unless it is laid down for the winter. In recent years Hall's Japanese Honeysuckle has become very popular. It is too tender for the colder parts of Ontario, but in South-western Ontario the profusion of the small white and yellow flowers and graceful foliage make this a very attractive climber. The native honeysuckles *Lonicera hirsuta,* and *Lonicera glaucescens* are well worth growing.

One of the most satisfactory vines is the Climbing Bitter-Sweet or Wax-Work, *Celastrus scandens.* The foliage is of an attractive shade of green, and is very rarely troubled with insects or disease. When established it is a very rapid grower, sending out long stiff shoots which, when they reach something to twine around will do so. It is particularly suitable for training over verandahs, summer houses and

fences. In planting this vine one should be sure of having one which produces both male and female flowers as some vines have only male flowers, and in such cases no fruit is produced, and the vine is not nearly so attractive as it otherwise would be as the fruit is very conspicuous and hangs on most of the winter. The berries are orange in color until they are cracked open by frost when they show scarlet. The Japanese species, *Celastrus orbiculatus,* or *Celastrus articulatus,* is, if anything more attractive than the native species, for while the berries are smaller they are much more abundant and the contrast in color between the outside and inside of the fruit, namely yellow and orange, is even more charming, and the fruiting branches more graceful, than the Canadian species.

One of the most striking vines is the Dutchman's Pipe *Aristolochia Sipho* While not as hardy as some climbers it does very well at Ottawa once it gets established, which usually takes two or three years. It looks particularly well about the verandah or pillars of a large house. The leaves are large, heart-shaped, and deep green. It climbs by twining. The flowers which are nearly hidden by the leaves are brown and of a peculiar shape, much resembling a Dutchman's pipe, hence the name.

Grape vines are sometimes used with good effect over pergolas, verandahs or summer houses, but unless kept well sprayed are liable to become infested by insects and the leaves be much disfigured before the summer is over.

Among the most beautiful climbers are, of course, the climbing roses. Unfortunately those delightfully sweet-scented varieties Gloire de Dijon and Marechal Niel are too tender to be very satisfactory even in the warmest parts of Ontario, but with the Tausendschon, Crimson Rambler, Dorothy Perkins, American Pillar, Hiawatha and others with their myriads of blooms, even though not highly scented, one may make very beautiful, what would be otherwise unattractive, places. As the foliage of climbing roses is liable to become disfigured from insects or disease unless very thoroughly sprayed, we do not recommend using these in the front of a dwelling, where, after the blooming season is over, they may become unsightly, The foliage of American Pillar is less affected with red spider than some other sorts.

Some other climbers which are useful in the warmer parts of the province are the Wistarias which are very beautiful when in bloom in spring, but not very attractive throughout the season, and the Trumpet Flower, *Tecoma radicans,* the flowers of which are red orange and quite attractive but the foliage not very satisfactory. The Actinidias are very strong growing vines but are really too rampant to be entirely satisfactory.

The Matrimony Vine, *Lycium europaeum* is a fairly well known climber and is rather shrubby in appearance. The scarlet fruit in autumn is attractive, but this vine suckers badly and unless desired for covering rocks, or stumps, or fences, is scarcely desirable. The Chinese Matrimony Vine *Lycium chinense* has larger fruit than L. europaeum, hence is more attractive in autumn.

The Kudzu vine, *Pueraria Thunbergiana,* is a very strong grower where it succeeds well, making as much as fifty feet of growth in one year. In the south the stems become woody, but in most places in Ontario this vine would die to the ground each year, while at Ottawa it has not become permanent. The foliage is rather attractive, and its very rapid growth makes it a useful climber where it grows well.

The Wild Hop is a great standby in the Prairie Provinces. While it is herbaceous and dies down each autumn, it is very hardy and makes rapid growth, and might be used to advantage in the coldest parts of Ontario.

The Variegated Japanese Hop, unlike the Canadian Wild Hop, is an annual and is one of the most striking of the annual climbers. Part of the leaf is almost pure white and part grey, making the contrast with the remaining green portions very pleasing. The seed should be sown early in the spring, and after the young plants have developed sufficiently to note which have the best or whitest foliage, they should be thinned out. The seed should be picked off as they form as they injure the appearance of the vine. The Maderia vine is a popular climber which has to be treated as an annual; the root being planted out after danger of frost is over, and then taken up in the autumn and kept dormant over winter.

Among Annual climbers Sweet Peas and Nasturtiums are the most beautiful, but there are several other very useful sorts among which is the Canary Bird Vine, a rapid grower and pretty both in leaf and flower, the latter being bright yellow in color.

Morning Glories have their place. They are nice to look out at in the early morning, but should be planted where the vines will not be too conspicuous, as the foliage is not particularly attractive. The same may be said of the Scarlet Runner. *Cobaea scandens* makes a handsome climber, but in the colder parts of Ontario it is necessary to start the plants in a hot-bed or greenhouse, and not put them out until danger of frost is past. The flowers are either greenish-white, or purple, but the purple flowering variety is the better.

Among the comparatively long list of climbers which have been mentioned, there must be some which will appeal to everyone who desires to make his home more attractive, and it is hoped that this paper will induce the members of the Ontario Horticultural Association to use vines more freely.

LAYING OUT FLOWER BEDS.

Richard Marshall, Toronto.

If there are two things in the world that I love more than others, it is flowers and children; but both must be in their proper places. Flowers and children always ought to go together. The most successful gardener to-day is the man who studies the locality, the surroundings on which the beds are to be placed. During the last summer they told me that our Queen's Park has been the most beautiful spot in the Dominion of Canada. I have here a diagram of a circular bed 25 feet in diameter. I want you to know what in my opinion are the best kinds of plants, the names of those plants, and the color of those plants to make a bed of this description the most effective.

In the centre of this larger circle. I have a centre circle. That circle is filled up with Canna Multiflora, which is, I think the tallest Canna that is grown to-day. Around that circle, outside of the Cannas, I put a row of Yellow Cannas with green foliage such as the beautiful Canna, named Wallace. Some of you may know a better one. If you do, let me know about it. Those smaller outside circles are filled with Canna Multiflora that are fairly tall, but not so high as the centre ones; they don't break the view of the centre, but they are a nice uniform height.

Around the whole system here, I put a row of Canna Rubens. Now in those alcoves here I plant Yellow Coleus. For an outside border, I plant Irisene Lindenii, which is a dark, almost black bronze. With the dark edge, the yellow alcoves, and

Beautifying the verandah with climbing roses, palms and other foliage plants.

the dark foliage of the Cannas behind it at a distance, when one looks at those beds the bright yellow makes the dark foliage of the cannas look much brighter.

Take a smaller bed 15 feet in diameter. This will look very beautiful in this manner. You place in the centre of that bed a nice Cordelia about 2 feet high or a nice Dracaena Cordelia for a centre plant. Around that centre plant you put silver leaved Geraniums followed by dark leaved Isimine Lindenii. In that circular bed I put half a dozen of dark colored plants intermixed with verbena venosa, which shows up the beautiful purple and heliotrope shade, and makes a beautiful appearance between the dark Lindenii and the silver leaf geraniums.

Then take a bed 9 feet wide. A bed of this description takes three rows of Cannas down the centre, and I believe King Humbert to-day is the best we have. Next to those cannas I put a row of Golden Bedding Geraniums; next to that I put a row of Red Sport Coleus, and you can put either White Alyssum or a Dwarf Blue Ageratum, which looks equally good. Flowers that are next to grass or gravel would not be alike. Red always looks well next to gravel, and white looks equally well next to grass. Where a bed is on grass, if you edge it in white, it looks better than it does if it is edged in blue. Now there are other plants which can be used which for the amateur come a good deal cheaper than the Coleus. In the old land we used to grow a plant called Perilla Nankinensis, and you have the best substitute there that I can give you for using in that way.

SCHOOL GARDEN ASSOCIATION OF AMERICA.

Chester B. Hamilton, Toronto.

Throughout the United States there is an organization called the School Garden Association of America. That institution in every state has its representatives in every city in the United States, and it also includes Canada. In every province of Canada there are representatives to the School Garden Association of America. They hold their Conventions twice a year—last February there was a Convention held in Detroit, in which Mr. Stevens, Mrs. Cadwell and myself were the Canadian representatives. The meeting conducted there was very interesting and uplifting in regard to school children's work.

The School Garden of America costs $1 for membership. They issue a folder every month, and it has items of interest as to how to conduct school gardens, and make them a success.

The Dominion Parliament in the year 1913-14 passed an Act, called the Burrell Act, which donated $1,000,000 for extending the knowledge of agriculture and horticulture in the rural and village schools of Canada. We in our garden movement in Toronto wanted money. We only have the dollar which come from our individual subscriptions, and had plenty of use for all we could get hold of. The arrangement made by the Dominion Government was that in 1914 $700,000 should be distributed among the different provinces; the next year $800,000; the next year $900,000; in 1917, it will be $1,000,000, and in 1918 $1,100,000 distributed *pro rata* by population, or whatever they decide throughout the different provinces. After that for the succeeding five years it will be the same—$1,100,000.

Knowing of this fund, in 1915 I applied to Dr. C. C. James, and asked him could nothing be done by which Ontario towns and villages could be participants in that fund. He said that he was thoroughly in sympathy with me, but that all the

money for that year was allotted, and that he would try to do something another year. In the last blue book issued by the Department of Education in 1915 called "Course of Study of Public and Separate Schools," the clause that refers to this particular thing, has the words "rural and village" eliminated, and where it read before, "The board of a rural or village school," it now reads, "the board that maintains throughout the year a course of instruction in Nature Study." On page 84 there is a schedule drawn up which shows that each teacher in a school who holds a certificate of having passed the examination at the Guelph Summer Course is entitled to an additional $30 over their regular stipend from the Board, and also the Board will receive $20 for work done by that teacher. Uncertified teachers can receive $15, and the Board receives $10. Now in Toronto we have 1,200 teachers, 95 public schools, 75,000 registered pupils, and 49,500 daily pupils; of these 1,200 teachers 200 are for the smaller children; leaving 1,000 who have children under their care old enough to do gardening. If all these teachers were uncertified, Toronto would get $25,000 for that purpose. In talking this matter over with the Department of Education, they tell me that they are not in shape yet to carry out this scheme in its entirety for the city, They are trying to perfect a scheme by which they will be able to allot the amounts and make it go around, because in a school with thirty teachers, that school would receive a tremendous amount of money, and, if every city and town in the Province would do the same thing, the grant would all be used up and there would be nothing for the country. However, in another year we hope to have it worked out to the satisfaction of every Horticultural Society.

Prof. Crow: Would it be possible for this Association to become affiliated with the School Garden Society of America?

C. B. Hamilton: We are now.

Prof. Crow: We could not do better than to follow this matter up and establish closer relations with the School Gardens Association, because the work is so very near what we have in mind.

C. B. Hamilton: The Convention is to be at New York on the 30th of December.

Moved by Mrs. Cadwell, seconded by Prof. Crow, "That Mr. Hamilton be sent down to represent this Association at that next Convention."—Carried.

HARDY ASTERS AND OTHER DECORATIVE VARIETIES OF PERENNIALS FOR THE AUTUMN GARDEN.

Miss Blacklock, Meadowvale.

"No man so callous but he heaves a sigh
As o'er his head the withered cherry flowers,
Come fluttering down."

Thus beautifully does a Japanese poet breathe the regret of his fellow-countrymen when their beloved cherry blossom season is passing. I fear most of us do not waste much sentiment on the fall of the tree blossoms, beautiful as they are, because there is still such a wonderful, gorgeous abundance of other flowers to come; but there are few amongst us who do not heave sighs a-plenty when we wake up some morning and find that "the frost is on the pumpkin," and, alas! our nasturtiums, salvias and too many others of the annuals that have been making such a riot of color in our gardens, are mere blackened masses of decaying vegetable matter.

Sadly we clear away the debris, disposing of it according to our "lights." The piled up city scavenger carts bear mute testimony as to where most of it goes, though the "canny" ones amongst us give the poor things decent burial (if not too seedy) in the compost heap.

We try to philosophize, telling ourselves it does not matter, winter is so nearly here, but is it? Oh, no—there is from six weeks to two months of our magnificent fall weather yet to come—The "Made in Canada" brand, and that generally spells perfection. And are our borders to be a blank waste all this time? Perhaps we cannot help it this year, as it is too late to mend matters, but the lesson can be learned now, which is to provide plenty of good fall-flowering hardy perennials for the border, even if needs be, some annuals must be left out to provide room for them. Then the early frost will have no terrors for us, for if there is one thing that we can really depend upon in the weather line, it is that early, blackening, devastating frost.

The hardy Asters alone would more than fill the breach by using early, mid-season and late varieties, and they are so lovely! The misty blues and mauves, the rich pinks and purples, seem to melt into the autumn tints of the trees and shrubs, resulting in an exquisite harmony of color. But before beginning on the Hardy Asters, I would like to recommend a few other good tall subjects that make an admirable background for them. Some of the Rudbeckias are excellent in this connection. R. nitida Herbstonne is one of the stateliest, reaching a height of seven or eight feet, with soft yellow flowers and very long green cones. R. subtomentosa is of medium height, four to five feet, is of quite a bush-like growth with rich yellow flowers, the cone being small and of a deep chocolate brown. It has all the glowing color of R. Newmanni or our wild "Black Eyed Susan" with a refinement of growth all its own. R. maxima (Synonym Californica) with large rosettes of glaucus leaves at the ground, from which spring stalks six or seven feet high, has large pale yellow flowers with very long, nearly black, central cones. This variety has promised well with me for the past two seasons, but its performance has been rather disappointing, perhaps because it receives the full force of the west wind on a very exposed hill-side, it just escapes being a fine thing by having an unhappy look. For happy growers commend me to the Heleniums, they are literally "the flower for the million." Whether it be the very richly colored H. rubrum, the fine old H. Riverton Gem, with its wall-flower red blossoms, the soft yellow H. Riverton Beauty, with brown centres broidered delicately with gold, or H. Autumnale superbum, towering often to seven or more feet, with solid yellow flowers, they are all good, easily grown and wonderfully effective in the fall garden. They give us a bouquet of flowers to a stem, that is as large as an umbrella, and as a background for the Hardy Asters are positively invaluable.

Boltonia Asteroides (False Starwort) is another "good doer," and its great quantities of starry white flowers massed on top of seven to eight feet stems are delightfully light and graceful. Another fine white flower is the Giant Moonpenny Daisy, Chrysanthemum (Syn. Pyrethsum) uliginosum—which rivals the Boltonia in height, and is equally beautiful. It might be described as a bush Ox-Eye Daisy.

The Autumn Monkshoods must not be forgotten. The glossy, as if varnished, finely divided leaves of Fisher's Monkshood, would make that variety quite well worth growing for its foliage—but in September and October when its massive spikes of lovely soft blue flowers begin to open we worship it for them alone. The deep purple, rather scattered flowers, on elongated spikes, of the old fashioned autumn Monkshood, are not to be despised though, where there is only room for one,

let that one be Fisher's, by all means. Delphiniums too, if cut down to the root after their midsummer display, can generally be relied upon for autumn bloom, but the spikes are miniatures compared to their earlier efforts. Spring-sown seedlings, however, often are quite effective at this season. But for lovely autumnal effects nothing excels, or indeed comes up to, the Hardy Asters or Starworts, also called Michaelmas Daisies. Perry's Blue, Perry's Mauve with Acris and the small white Aster ptarmicoides, a charming wee thing suitable for the front of the border, usher in the season towards the close of August, though the Amellus section, of strong upright growth about a foot in height or a little more, with larger flowers than any, comes still earlier and would be therefore beyond the scope of this paper were it not that their stick-at-it-iveness keeps them well to the fore. Precioza, a rich violet, Beauty of Ronsdorf, a large flowered pinkish mauve, and Perry's Favorite, a very pinkish mauve, are fine varieties. Beauty of Ronsdorf is larger, but the others are better in color. There is a new one called "King George," which is said to be very fine; three inches across and of a good blue color, which sounds most entrancing. This section is invaluable for the foreground of a wide Aster border. With September, the Aster season comes on with dancing feet hanging her garlands everywhere; each little rod shakes out of sleep its quota of flowers, and from tip to base becomes a wand of magic beauty.

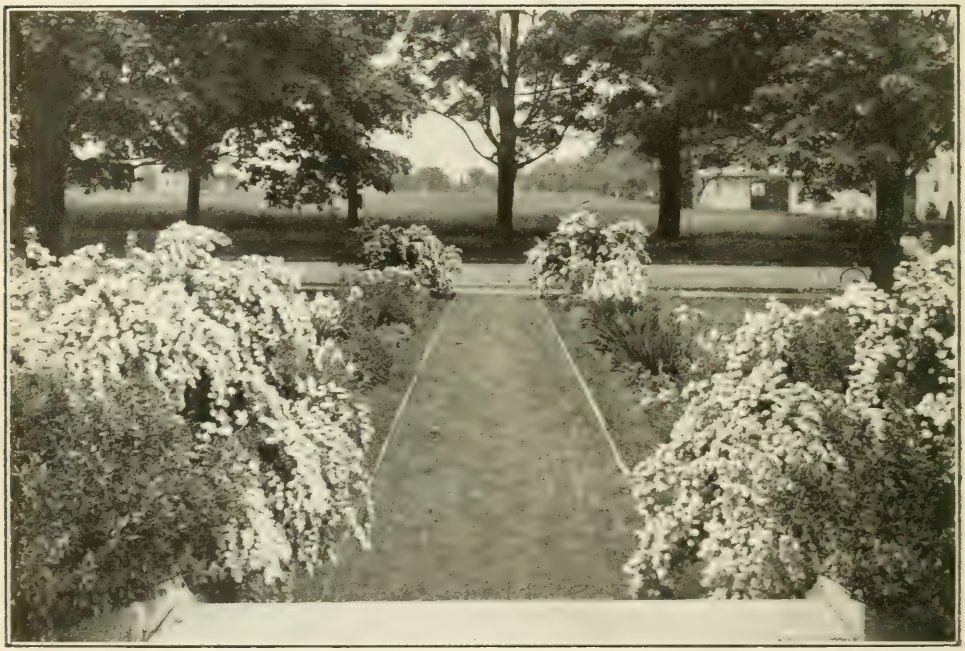
Does it all finish with September? Oh, no. It has just fairly begun. When one leaves off another begins, and October scarcely sees the close of it. That is left for "drear November," then we harden our hearts and cut them all down, and have a bonfire before the seeds get ripe enough to fall, or perhaps we should have too much of a good thing next year.

There are very many lovely varieties, but to my mind, the outstanding ones are as follows. In the Nova Angliae section, Lil Fardel, a fine rich pink. In the Nova Belgii section there are a host of good things. Perry's Blue and Perry's Mauve, early Feltham Blue, Cloudy Blue, an exquisite mass of pale lavendery blue, Keston Blue (a very rich color), Perry's Pink Improved, a good rich pink, Heiderose, a very soft pure pink, Amos Perry, a fine early aster of dwarf growth with a perfect cloud of soft pink flowers, and St. Egwin a fine late pink. Not classed in any section are several very fine varieties, such as Coombe Fishacre, a flesh colored variety, coming late and with wonderful lasting qualities. Hon. Edith Gibbs with tall wand-like sprays of delicate pinkish lavender, and finest of all, the very queen amongst Asters, Climax, with its large soft lavender blue flowers centred with gold. A clump of it forms a mass of bloom as large as a fair sized Lilac bush and quite as effective—Perry, of Enfield, says,"Climax is undoubtedly one of the best six asters in cultivation to-day," and I do not think there are many who would contradict him, though they might wonder what other five varieties he considered equally good. In the Cordifolius Section, both Profusion, a pale mauve, 3 to 4 feet, and Ideal, dwarf, a soft lavender are simply exquisite. Of the small Heath-like Asters ericoides Enchantress is very like our own wild one and equally beautiful, and Katie, white changing to rose, belonging to the same section is pretty, so also is another small white aster known as A. Tradescantii, with very starry white flowers. In the Vimineus section, Maidenhood is a good variety, and so is Delight.

With all this material to work with there is no need of being hopeless when frost comes, as the plants described pay no attention to it and are quite as fresh after waking up with its spangles bedecking them as before.

Some day I hope to persuade one of our landed proprietors with unlimited acres at their disposal to try the English fashion of having spring gardens, summer

gardens and fall gardens. It would be quite an education, and I should dearly love to have a hand in the laying out of the spring and the fall gardens. The midsummer display could be safely left to those who rejoice in them. The fall garden in my mind's eye should occupy both sides of a path leading down into the woodland, with good generous borders on either side, where the Hardy Asters could be planted in great masses backed by large clumps of Rudbeckias, Helenium, Boltonias, etc., and back of them again shrubs, some chosen with a view to their autumn coloring, such as Cornus Siberia, etc., and others for their fruit, such as the various Barberries, Snowberries, etc. It could be made a perfect dream of glorious color masses. What bliss to feel it growing under your hand—painting a picture with the dear growing things for pigments—truly a work to draw down the envy of the gods.



Spiraea van Houttei.

Miss Yates: With the material that we have just had laid before us, in leading the discussion the difficulty is just what line to open first.

I intend only to bring up one of the points that seems to me of great value. The peculiarity of this group of hardy perennials is the power they have over our affections. They possess the most curious quality of making one feel homesick for them when one is away, and one needs them. They awaken longings for them, if you once learn to know them well you want them again.

Last night we listened to Mr. Hughes' thrilling tones, when he flung out a challenge of scorn to those who said the love of flowers is likely to make a man effeminate. Now cricket and the love of flowers in many people's minds have been classed together as likely to make men effeminate. One part of the answer to that is well known, for the story of how Britain's fighting cricketers helped bomb the Germans out of France is well known to you all. But the other side, the love of

plants that has been carried by our Tommies far into the battle line may not be so well known. Gardening is also one of the hobbies of "The army behind the army," of whose work we know so little; and from the casualty clearing stations at the front to the workers' huts at the bases are to be counted thousands of English made gardens. The French, who know as little of us as we do of them, were not a little surprised to find that wherever he sojourns the British workman insists on making himself a garden. At a great veterinary hospital at one of the bases, the men living a considerable distance from a town, and away from other pastimes have planted for themselves gardens that would be a credit to any prosperous London suburb in peace time. So much for those things.

I wonder if any of these horticulturists have seen the letter that has been sent by the Scottish chaplain of the Y.M.C.A., Mürren, Switzerland, in which he says that 427 wounded interned Tommies have been asking for copies of gardening papers at their reading rooms. At the Ruhleben Internment Camp there has been a Horticultural Society formed, and it is on record with the R.H.S. In this letter they have asked for affiliation for the Ruhleben Camp Horticultural Society of British soldiers. Their object is to beautify the grounds around the barracks and public thoroughfares in the laager, and to further the knowledge of horticulture. The letter goes on to say, "It may interest the members of your society to know that gardening started immediately after our internment in the camp, and since then has steadily increased. During this, our second summer, the magnificent show of flowers and tasteful decorative schemes which were carried out have done much to alleviate our lot." I wish the Ontario Horticultural Association could send them some seeds. Why should they not?

Effeminate! And England in the trenches dying for all the world! Effeminate! Surely enough has been said to prove that cricket and the love of flowers has not made our men effeminate. The average man in my country is a sportsman and a soldier still, in spite of, or perhaps because of his love for cricket and his love for flowers.

It is this very power of endurance in the perennials that appeals to the British mind. Is there anything more appealing in any character than that acquiescence in renunciation, than that doing with the least which those flowers do, and yet give us a gorgeous return?

It has been my privilege during the many years to grow from time to time a great number of those flowers that have been shown, and my experience with them allows me to corroborate all that has been said by the writer of that paper.

I have found, however, that unless the little Alpine aster is raised from the ordinary level of the ground it kills out.

Miss Blacklock: I did not touch upon the little Alpine Aster, because it is a spring flower, and I was dealing solely with fall flowers.

Miss Yates: I mean when raised to seed the first year.

Miss Blacklock: I have not raised it from seed. It certainly needs to be raised, and not to be on a dead level of the bed, or it will die out in winter. As far as the others are concerned, they certainly thrive very easily, more so than common Phlox or fifty other things that you can mention. In fact, you can hardly kill them. I would like to hear what Professor Macoun has to say in reference to that section of Asters. I found that they were hardy at Ottawa and that was why I went into it. But I found that I lost fully half my plants last winter.

Prof. Macoun: We find at Ottawa that there are a number of plants that we can preserve at Ottawa on account of the heavy covering of snow, which you

cannot do here. Take the Japanese Anemone, it never dies with us. The only difficulty we have is that the frosts come on a little early in the fall.

T. D. Dockray: To add to what Miss Yates said, concerning the love of some of the men at the front for flowers. A past president of this society, now a captain at the front, sent back to the Toronto Horticultural Society the prospectus of a Horticultural Society that he had been instrumental in forming among the officers of the Engineers Corps somewhere in France. The Society donated two prizes, and asked for a report of the season's work. A man must grow something even whilst under fire.

PRESS WORK IN RELATION TO HORTICULTURE.

Mrs. R. B. Potts, Hamilton.

"Nature does not capriciously scatter her secrets as golden gifts to lazy pets and luxurious darlings, but imposes tasks when she presents opportunities and uplifts him whom she would inform. The apple which she dropped at the feet of Newton is but a coy invitation to follow her to the stars."

"The newspaper press is the people's university. Half the readers of Christendom read little else."

The task of presenting this theme for your consideration was assigned me, not that I have the honor to hold a brief as a representative of the press, but probably because, in our local work, it has fallen to my lot to have occasion frequently to experience what is possible when the press co-operates with the workers. If a story of struggle for recognition of our Society's work by any editorial staff is anticipated, disappointment must come to those so expectant, as my connection with the work, if reported in detail, would be a history of unfailing courtesy on the part of the editors concerned.

As there are many, judging by the questions frequently asked, who do not yet really understand what a Horticultural Society is, when visiting other towns and cities it has been my custom to ask the workers what aid the papers gave them and what use they make of their papers. In a few cases—a very few—copies of the local papers have been handed out for inspection, with the query, "What could one expect from that?" or "How would you deal with the like of that?" Granted that in these cases the prospects were not very cheerful, yet the conditions did not appear to be entirely hopeless. A good motto to remember is "Where there's a will there's a way," so, in these cases—if a leaf had been taken from the records of our neighbors across the line, some gilt-edged missives might have been sent, in true diplomatic form, to the august ruler enthroned in the inner sanctum, to pave the way for a nearer approach. It might be necessary even to hint at an ultimatum before the way would be opened for action to be taken, as a bundle of notices of proposed withdrawal of subscriptions generally has an awakening effect as a siege, heavy and well-organized, usually can produce results, especially if this is in the form of promised new subscribers—the effect is proof of the awakening value of the action.

The old lady from Cape Cod was right when she stated that it all depends on the glasses one wears, whether "the nigh-to's," "the fur-off's" or "the mejum's"; and while, as a rule, up-to-date editors naturally have a good supply of lenses, there remain a few occupants of editorial chairs who either mislay their supply or whose glasses do not fit, for some suffer from astigmatism, a few very badly, and really require special treatment.

There are, too, some editors who are "in a rut," and to them the words "Every-day is a fresh beginning" means only "the grind at the office," showing clearly their need to get out and have Nature do her kindly offices for them, as the statements that "Every day is the world made new," and "The old order changeth yielding place to new" is an untranslatable (by the light which dimly penetrates through their office windows) as the language of the ancients, and owing to this habit of shutting doors and windows, they never hear the criticism of dissatisfied subscribers, the thinking portion of their readers.

Charles Dickens, in "Pickwick Papers," stated that "the press is a mighty engine," and Byron wrote:—

> **"But words are things, and a small drop of ink**
> **Falling like dew upon a thought, produces**
> **That which makes thousands, perhaps millions think."**

Just as dew fulfils its mission in relation to living vegetation, reviving and refreshing, so the drops from the ink wells, if the thoughts prepared for the press are really vital ones, will not fail in their function; but, if otherwise, the crop of thoughts harvested will not result in life-giving principles to a dozen, and certainly not to the thousand or million readers.

Napoleon said, "Four hostile newspapers are more to be feared than a thousand bayonets," and Theodore Hook stated that "A reply to a newspaper attack resembled very much the attempt of Hercules to crop the Hydra, without the slightest chances of success." What, then, if these forces are arrayed with the workers? To those organizations which fail to make what use they might of the co-operation of the press of their town, a real loss must come to the Society. Nor is this all; for, as readers generally will look elsewhere for what they need, there will be a loss to the editors as well.

Not long ago a worker reported to me that an editor when approached stated that "There was no demand." Now as this should be a business consideration—a reciprocity, in fact—the first consideration would naturally be to follow business methods; and, as far as my experience goes, it is distinctly noticeable in the business world, when some one has a new commodity to exploit, the new thing must first be introduced to the public, and the method of approach depends upon the locality and the party introducing the article. Success depends first on suggesting a want, then in creating that want through the suggestion, and the demand invariably follows. The live editor knows that "the crowd follow their leader" as surely as the sheep the bell wether, and he rarely fails to make use of an opportunity, once the opened door of his sanctum reveals the conditions existing. Charles Dickens said "A word to the wise is sufficient—for them." Only fossils are impervious to "impressions."

Another worker claimed that an editor who was approached, said that "It was a bread and butter question with him"—a very live question (often a large problem to all housekeepers.) Hence we have the greatest sympathy for that man—yet here was a most excellent opening to show him that the results of the proposed plans were likely to create a demand for his paper, and so bring "jam" for his bread and butter, as well as help to add to the economic improvement of his readers. What a glorious opportunity that committee lost when they retired defeated! Here was an editor who had opened the way to introduce him to "the economic side of horticulture," and who might have been given hundreds of interesting and vital facts, which would have been such splendid copy for his paper, and at the same time made for his subscribers much better, and far more interesting reading than they were

in the habit of getting. It would have prevented the repetition for the fourth time in three weeks of the appearance of a worthless article, half a column long, being used as a "filler," as was the case just at the time this interview was staged. This editor might have had the opportunity to fully realize the truth of Bovee's words, "A good thought is indeed a great boon for which God is first to be thanked; next he who is the first to utter it; and then, in a lesser, but still in a considerable degree, the friend who is the first to quote it to us."

A paved walk.

Now it may be that an editor when approached admits that he "is not posted along horticultural lines"—He has not adjusted these lenses for himself—and may ask therefore that the petitioners prepare the copy—a not unreasonable request—since one in close touch with the work would know the most essential details better than anyone not familiar with it. "Horticulture is a science and an art," and its scope is not comprehended by many of our citizens yet.

One of the results of garden visiting during the several years past has been the harvesting of experiences and confessions—many of the latter coming to me as a great surprise—one of these manifesting, through the frequency of its reappearance its importance, *viz.*, that people are frightened away from lectures for fear of having to listen to addresses given in terms unknown to them, which, unless the lectures are illustrated, convey no ideas to their minds; and that garden articles are, as a rule, passed over for fear they are "too deep for ordinary understanding," especially if these are appearing dressed in technical terms. While realizing the need and desirability of "educating up" to the right and proper standards, and knowing that I am here introducing a subject which has provoked many warm discussions, still as time passes and opportunities broaden to ascertain the real state of affairs, I am more than ever convinced that recognition must be made of this fact, and that to be of real use to a large proportion of citizens, much of our garden literature must be of a most simple type, and in a form easily available, and the readers be led up step by step as children are at school. That much which is available—if the price is paid—is not in a form easily assimilable to many, and hence not attractive reading is constantly revealed. Yet these are the very persons most requiring the material and instruction. The newspaper is the poor man's library, and it should be our concern to help him obtain the literature he requires in a form which he can enjoy and use, at a price not beyond his ability.

"Man does not live by bread alone," so the question of mental food is at least as important as that of the physical, and any good housekeeper knows that the plainest and commonest of foods, prepared with thoughtful care, presented in a condition attractive to the eye, will be relished as much (and often more) than more expensive dishes—they are certainly frequently more nutritious. To any editor the economic side of horticulture should be interesting, and never was there a more opportune time to present this phase of it than to-day.

Then, too, in these days of nerve strain and high pressure living surely the introduction of an antidote in the shape of an interesting, and at the same time profitable relaxation is to be welcomed. It may be that an outbreak of an epidemic may lead the health authorities to yearn for the support and active co-operation of horticulturists and editors, and this is true in the annual "Clean-up Campaign" conducted in all live localities or when some disease-breeding places require attention. Here are open doors of opportunity for workers, since we can easily show the editors that horticultural societies have a message of importance for the people, and desire to aid in securing the best results for all.

One thing which is constantly impressed upon me—and that because of the frequency with which letters come to me, asking as to "how" and "what" and "if any magazines or books are available" dealing with the questions asked—is that after years of careful search, and repeated attempts to help those who appeal to me for aid, a Canadian garden literature, available for the mass is badly needed. I find myself agreeing with what a leading writer penned several years ago: "The gardening of Canada is distinct from that in any other land in many particulars, incident to the differences in latitude, atmospheric influences, etc. This is why horticultural books and periodicals of other garden lands are not to be accepted as close guides. In the past people have blundered, adopting the methods and materials applicable elsewhere, but not successful in our own land."

To secure the results we desire here, what a grand thing it would be if the members of horticultural societies would keep a record of their successes, failures, and general experiences, and turn these into a central bureau, where use could be

made of such for those who are struggling to meet the very conditions which would be reported in the returns thus made. Also if societies giving out premiums would report on the results obtained from the "new things" which they try out, and which have been grown under the usual conditions found in the average home gardens, and not under the loving care of the expert few. What a clearing-house for ideas this would eventually become. While we who know of the work of our expert growers honor them for the splendid services they have rendered, conditions under which the large majority labor are not the same as those under which the specialists work, and there are many who do not know where to turn for aid from those who from a very realizing sense of its need can best appreciate the difficulties and give that aid. Take the case of soils and fertilizers, of what use are the articles which show that the writers have an unlimited supply of both at their disposal, when the readers in towns and cities cannot secure an ounce "for love or money?" At present there are very many whose largest crop is discouragement, and who steadily harvest failures. These are laboring under heavy odds to-day, lacking both materials and instructions, so if the newspapers agreed to assign space to this matter it would reach many not helped to-day. If members of our societies are but willing, a most useful literature could be produced in this way, but it must be an organized effort to be successful. Just as is the case in a plant exchange system.

If it is the intention of any one present to undertake some press work—to make a start (the editor of the paper being willing, of course) a friendly word may not be out of place here. Let me urge you first to notice what is most needed, then prepare. Be equipped with as full a supply as possible of the needed information, and have the very best obtainable as far as quality goes. Then, having succeeded in this step, if the community is not manifesting a "demand," set about to create it. It may be—in fact often is—a dormant "Want," but it will speedily manifest itself and often in a surprisingly rapid way.

Let your editors know of your appreciation of their co-operation, by sending to their office parcels of plants and flowers (these ministering spirits) with your compliments—not complaints—and thanks. If the chief does not garden some of the men in the printing office will, and in this way civic beautification will be helped a bit, as well as the winning of another friend for the Society. Samples of member's garden produce have never been known to be marked "not accepted" though copy may have been.

If it falls to the lot of any member to prepare manuscript to be used, never let it out of mind that it is done to attract the majority, and not prepared entirely for the favored minority, who have the time and opportunity to read more advanced writings if they desire to do so. Concentrate on making the articles attractive, thus awakening an interest which is to result in actions demonstrated in the backyards of your community. Instructions in the press articles may be made as palatable and as easy to take as the sugar or gelatine-coated pills, which prove as effective when swallowed as the more unpleasant kinds. Readers are like children many of them, looking for what is attractive to the eye, so conditions must be made to suit such cases. They are the most urgently requiring attention, and instruction.

Let me quote here what was written before the war, but which I think most of you will agree with: "In literature notice how frequently the word "sensational" occurs, and its relative ones, thrilling, racy, exciting, startling, astonishing, striking, etc. These are sensational days. Anything plain is too tame, so even nature articles are, in special features, much magnified and then galvanized, and after reading such the reader goes forth tingling with the effects of the magnetic current, and finds

nature as revealed by herself very slow, very uninteresting, because he does not know how to look, nor where to look, nor what to look for. Many people have no power to entertain themselves, can discover nothing for themselves, and conclude that all that is natural is a dull void, their mental appetites and otherwise have been pampered on artificial things, and only a giddy whirl is attractive. Some day the common-place may seem to be the rare which is now so sought after."

It is our duty and privilege to help to create a diet of healthful things, attractive in themselves, though we may first have to create a "want" for them. It recalls the story of a little girl whose mother desired to administer a beneficial dose, and who met her with the reply. "I don't want to, and I don't want to want to."

This might be our experience, too, as it is often the readers whose mental appetites are not normal whom we must cater to. Just as the housewife prepares with nicest care the invalid's food, so must thought and care be bestowed on the

An artistic residence.

mental food to be served by us, in order to win this class of readers to taking a healthy interest in the pleasant and profitable lines which horticulture opens for us all.

The value of the press as a partner, and its influence cannot be estimated, and hence an opportunity to co-operate in a work which is to bring others to join our ranks and help them to enjoy life through learning to read and understand the Book of Nature, is not a duty to be cast lightly aside. This, if undertaken, means not only happy hours for readers, but, because of the increased demand for the paper, benefits the editor as well. And, as advertisers are not slow to note the drift of the current, there will be requests for increased space in order to put before the readers the wares for which a demand has been thus created. No editor, however, addicted to habit of "staying in a rut," can long withstand this form of argument.

Realizing then the need and importance of this line of work, as "delays have dangerous ends," after experience has performed her work as instructor, and careful study has been made of what others have learned in this section of life's school, and the facts have been added to complete the equipment, it is time to remember the advice given to.

"Use the pen! there's magic in it,
Never let it lag behind;
Write thy thought, the pen can win it
From the chaos of the mind."

REPORT AND CONTRIBUTIONS OF THE COMMITTEE ON NAMES AND VARIETIES.

Your committee begs to make the following report and to submit for publication several contributions from its members:

Owing to abnormal conditions due to the European war your committee found it impracticable to undertake all the work which it planned to do at the beginning of this year of office. One of the chief features of its work, namely, reports on "New or Little Known Plants," is contributed herewith as usual. Several other important features of its work, however, your committee regrets to state must be held over for another year. Several new members were appointed to your committee at the last meeting of this Convention. It is most desirable that all the members should meet together for consultation at least once during the year. This year such a meeting could not be arranged. With a hope that the members may be able to meet during the coming year, it is felt wise to suggest that the report now presented be received as an interim one and that the main report be considered as held over till the next convention of this Society.

The loss to this committee of one of its oldest and most able members in the person of Mr. John Cavers, of Oakville, is a loss which is not easy to repair. His colleagues wish to place on record the esteem in which they held him and his unselfish work. He endeared himself to them by the gentleness of manner and high-souled honor of a thorough gentleman, and his work was always stamped by the qualities of ability, thoroughness and exactness.

The members of your committee now reporting are as follows: H. J. Moore, Niagara Falls, Chairman; F. E. Buck, C.E.F., Ottawa, Secretary; Miss M. E. Blacklock, Toronto; Prof. W. T. Macoun, C.E.F., Ottawa; Wm. Hunt, O.A.C., Guelph; O. J. Robb, Vineland Station; Jno. Cavers, Oakville; J. C. Crombie, St. Thomas.

Signed on behalf of the Committee,

H. J. Moore, *Chairman.*
F. E. Buck, *Secretary.*

NOTES ON NOVELTIES AND PLANTS NOT WELL KNOWN.

F. E. Buck, Central Experimental Farm, Ottawa.

The following flowers were either "novelties" offered by several leading seedsmen for the first time in their 1916 catalogues or flowers "not well known,' grown in the test plots at the Central Experimental Farm for the first time during the season of 1916. Those given below are the best of the flowers thus tested at Ottawa. Others were tested but owing to the fact that they possessed few points to recommend them they are withheld from this list. Reference to them may be found, however, in the Annual Report of the Experimental Farms.

Anchusa, Annual Blue. Plants about 18 inches high, different in character of growth to the perennial Anchusa. The foliage is finer; the flowers, however, are about the same size and of the same shade of intense blue. In bloom from July 17th till end of August.

Didiscus caeruleus, Pale Lavender. This is an attractive annual which should be better known. Plants 18 inches high. Flowers rather large, borne singly on long stems. Valuable for cutting. In bloom from August 1 till mid-September.

Amberboa, muricata rosea. In habit of growth and type of flowers this plant resembles the Centaureas or Sweet Sultans. It is not, however, equal to them in attractiveness and the flowers are less desirable as cut flowers. Height 18 inches. In bloom from July 10 till end of August.

Helenium tenuifolium. This is an annual variety of the popular perennial Sneezewort. Height 18 inches. Bushy habit of growth and flower abundantly produced. It has nothing to specially recommend it, however, being slightly weedy in appearance. In bloom from July 17 till frost.

Hemp Giant. A foliage plant which might be used to advantage at the back of a perennial border or as a water garden plant. Flowers inconspicuous. Slender and upright in habit of growth. Ten feet high.

Cleome, Giant Hybrids. This is the same as the ordinary Cleome in all respects except the color of the flowers, and only a few of these differ from the purple magenta color of the original. Height 4 feet. In bloom from July 24 till frost.

Nicotiana, Sanderae hybrids. The hybrid plants are somewhat less robust than their parents. They are, however, very satisfactory. Plants about 30 inches high. In bloom from July 15 till early frost. Colors of flowers pleasing. Free blooming and slightly fragrant.

Nierembergia frutescens. This is really a half hardy perennial which may be grown as an annual. Height 1 foot. Flowers, cup shaped similar to a Linum, white tinted lilac. In bloom from July 26 till frost.

Everlasting Star Flower. This is a very pretty little everlasting and a good addition to this class of flowers. Height about 1 foot. Flowers a pleasing pink, star-shaped, and borne in clusters. Suitable for cutting for winter bouquets. In bloom from July 9 till the end of August.

Ageratum, Mauve Beauty. An improved Ageratum both in regards to the plant and the deep shade of the blue flowers. Height 10 inches. In bloom from July 27 till frost.

Platystemon californicus. A pretty little annual which does best when the seeds are sown where the plants are to remain. Height 1 foot. Flowers lemon yellow. In bloom from July 15 till mid-September.

Euphorbia marginata. An attractive foliage plant. Leaves veined and margined with white. Height 2 feet. Makes good growth when seeds are sown where plants are to remain.

Euphorbia heterophylla. Another foliage plant. This is not, however, so attractive as "Marginata." Height about 2 feet. It has a certain amount of attractiveness due to orange scarlet bracts at the end of each branch. Flowers inconspicuous.

Godetia Lavender-trailing. This novelty had nothing to specially recommend it. The trailing habit rather detracted from its attractiveness as a garden flower. In bloom from July 17 till end of August.

DESCRIPTIVE LIST OF GREENHOUSE PRIMULAS WHICH ARE DESIRABLE FOR INDOOR DECORATION DURING THE WINTER AND SPRING MONTHS.

(Arranged by the Nomenclature Committee of the Ontario Horticultural Association.)

H. J. Moore, Queen Victoria Park, Niagara Falls.

1. Primula sinensis.

As the Primula sinensis varieties comprise the most popular and desirable class of winter flowering greenhouse Primulas, precedence is given to this class in this list.

From the species have sprung hundreds of single and many double forms. These varieties like those of Primula obconica, have never been comprehensively listed. Therefore, apart from nursery catalogues, information concerning them could not readily be obtained.

While the list is far from being complete the Nomenclature Committee hope that in the future a supplementary one will be issued containing the names and descriptions of any of the older species and varieties which may have been omitted, and also of the newer introductions as they appear.

As a matter of information the majority of the plants enumerated below have been grown for one or more seasons under the supervision of one or more members of the Nomenclature Committee, these species or varieties being marked thus *. In all cases those so marked may be relied upon as worthy of cultivation. Many new varieties introduced during recent years have not proved so good as many of the older ones, consequently they are not included in this list.

*Primula sinensis or chinensis. The flowers of the species are white or pale lilac and have notched petals. They are small compared to the flowers of the modern varieties. The leaves are fleshy with deeply cut or sinuate margins. These, like the stems, are hairy.

*Primula sinensis flore-plena. A double flowered form, sterile, therefore must be propagated by division of the root stock or by neatly made cuttings.

White Flowered Varieties.

**Alba magnifica.* A variety with pure white flowers which are beautifully fringed at the margins. A standard variety and one of the best of the white flowered plants.

**Giant White.* Of very robust habit. The white flowers are borne well above the green foliage.

**Giant Royal White.* Similar to the preceding variety except in color of foliage which is a delightful bronze.

**White Swan.* The white flowered inflorescences are loose and graceful. A very distinctive variety.

**Mont Blanc.* As the name implies, snowy white.

**Covent Garden White.* A standard well known Primula excellent for com-

Lily border.

mercial purposes. Flowers white with fimbriated petals.

**Double alba magnifica.* The flowers of this variety are beautifully fringed. The foliage is elegantly curled at the margins. A most worthy double flowered variety in every way. Propagation by seeds, division or by cuttings.

**Double White.* Flowers closely double. A very free blooming variety. Strongly recommended for general culture. Propagation by seeds (preferable) division, or by cuttings.

Pink Flowered Varieties.

**Giant Pink.* Probably the best of the Giant flowered Chinese Primroses. The flowers are extremely large with thick petals. The habit is vigorous and the plant of easy cultivation. Particularly valuable for home decoration.

**Pink Beauty.* Flowers a delicate flesh pink.

**Reading Pink.* A variety of normal habit with pretty pink flowers which are fringed at the margins.

**Rosy Queen.* A beautiful fern leaved variety, distinct in this respect from the forementioned varieties, therefore desirable.

**Double Pink.* The flowers of this variety are almost fully double. They are of a delicate pink color. These flowers make splendid buttonholes and are equally as satisfactory for cutting as the plant is for greenhouse or home decoration.

Blue Flowered Varieties.

**Reading Blue.* One of the pioneer blue flowered Chinese Primulas. The trusses of delicate blue flowers are borne on sturdy stems and have an erect habit. The plant should be grown in every collection.

**The Czar.* The flowers of this variety are of a rich violet blue color and are, therefore, darker than those of Reading Blue. It is of a very desirable habit and is vigorous and free flowering.

**Holborn Blue.* Another equally desirable blue flowered variety.

**Double Blue.* In color like Reading Blue. The flowers are, however, almost double.

Salmon and Orange Flowered Varieties.

**Salmon Beauty.* The flowers are large and generally of a delicate soft rose, shading at the margins to a deep salmon. The foliage is a deep green with a bronze reverse.

**Orange King.* A plant of excellent habit with flowers which in the bud are orange, later develop into a beautiful salmon pink.

Crimson, Scarlet and Red Flowered Varieties.

**Crimson King.* At present the best dark flowered variety. The flowers are an intense crimson with a small yellow eye. The leaves and stems are dark. The plant is exceedingly floriferous and produces flowers all through the winter and spring months. The foliage is deeply cut and highly ornamental.

**Giant Scarlet.* The deep rich scarlet flowers of this variety are distinct from any other, and for this reason the plant is desirable.

Prince of Wales. The flowers are a brilliant rich red. Not so dark, however, in color as Crimson King. The variety should be grown wherever a distinctly red flowered plant is needed.

Chiswick Red. This is an excellent variety with crimson-scarlet flowers.

**Double Scarlet.* This plant produces abundant double scarlet flowers of an intense hue, and is one of the best of its color. When grown among lighter shades it has quite a distinct character and should be more generally grown.

Bi-colored Varieties.

**The Duchess.* The most beautiful variety yet raised. The flowers are white with a zone of rosy crimson surrounding a yellow eye. The trusses are large and for a time quite compact, after which they lengthen and become even more ornamental. The flowers are borne well above the elegant foliage and at all times are distinct from those of any other variety.

**The Duchess, double.* Equally as charming as the single form and of the same color, although nearly double it produces seeds by which it may be raised. Also by cuttings and division.

2. Primula stellata.

The star-flowered Primula. The stellata varieties are next in importance as winter flowering subjects to those of sinensis. In some ways they are more desirable though not in all. Their floriferous and graceful nature, and the fact that they bloom for a long period make them almost indispensable for greenhouse, for room, and for table decoration. Their elegant sprays of loosely arranged flowers are excellent for cutting purposes and may be sent considerable distances. At Christmas the pink, rose and carmine varieties may be used effectively in conjunction with white single or Roman hyacinths. In fact with white flowers of any kind if of graceful habit.

White Flowered Varieties.

White Lady. Flowers of a pure white with yellow eye, each inflorescence a loose pyramid. The plant is generally of a graceful habit. The foliage is ornamental and of a bronzy-green color, the reverse of the leaves being of a reddish hue. The height is 12 to 15 inches.

Snow King. The stems are red, as also are the undersides of the leaves. The flowers are white and very large.

**White Star.* The oldest of the stellata varieties. The flowers are pure white. The foliage very dark, the former are, therefore, brought out in great relief.

**Silver Star.* A variety with pure white flowers, no yellow eye being visible. The stems and leaves like those of the preceding variety are dark, against which the flowers glisten like silver. The plant on account of this character is exceedingly attractive.

Blue Flowered Varieties.

**Coral Pink.* The introducers of this variety describe it as a plant with coral pink fringed flowers, vigorous and free flowering. It is evidently a new color in the stellata class, and for this reason should be grown.

**Pink Star.* A plant with the habit of the older white varieties. The flowers are of a delightful pink.

Rosy Gem. A graceful and most beautiful variety. The leaves are red on the under surface. The flowers are of a beautiful salmon-rose pink.

Blue Flowered Varieties.

Blue Star. The foliage of this plant is light green and the flowers are a soft lavender blue.

Dark Blue Star. The rich violet blue flowers which characterize this variety stamp the plant as a decided acquisition.

Crimson and Red Flowered Varieties.

Enchantress. A most distinct and beautiful Primula. The flowers are a decided crimson with a white eye. In this respect it is different from many of the star Primulas. This plant is especially attractive.

**Ruby Star.* This plant is unique in that its flowers are of a deep rich ruby color. It is the darkest of the star Primulas, and on this account it should be more generally grown.

**Crimson Star.* The foliage of this variety is dark. The flowers are a brilliant deep crimson.

3. Primula obconica.

To almost every plant lover the varieties of Primula obconica are familiar. The flowers of the modern varieties vary in color through all the colors from white to deep ruby. Between these extremes of color we find plants with flowers of blue, pink, rose, salmon, crimson and lilac, and many other shades which may only be correctly described with the aid of a color chart. For greenhouse or for room decoration the obconica varieties are well adapted, hence their general popularity.

The flowers of the species are pale lilac or purplish in color. The inflorescence is an umbel from which the flowers individually droop on their stalks. The average height of the plant is about nine inches. The leaves are rounded more or less and are heart shaped at the base. They are usually toothed at the margin.

The horticultural varieties of Primula obconica are numerous, and among them are many giant flowered varieties. The varieties generally are taller than the species and for decorative purposes far more desirable. As they are very similar in habit the name of the variety and the color of the flowers are simply given.

**Gigantea kermesina.* Rich crimson.
**Gigantea rosea.* Pure rose.
**Grandiflora alba.* Pure white.
**Grandiflora crispa.* Delicate rose with waved or fluted petals.
**Grandiflora rubra.* Red shade.
**Grandiflora Apple Blossom.* Soft pink.
**Giant Crimson.* Rich ruby crimson.
**Fire King.* Brilliant fiery crimson.
**Giant Pink.* Rose pink.
**Sutton's Blue.* Light blue.
**Lilac.* Soft lilac.

4. Primula japonica.

The Japanese Primrose although perfectly hardy, and, therefore, a valuable garden plant is also excellent for the cool greenhouse and is included in this list. The leaves die in winter. It is, therefore, dormant at this time and is a summer flowering plant. When grown in the greenhouse it flowers in spring and is very desirable as it has great variety in the color of its flowers. These may be maroon, crimson, lilac, pink or white.

The plants vary in height according to the conditions under which they are grown. The flowering scapes sometimes reach a height of 2 feet and are rarely less than 1 foot in height. Usually they bear six whorls of flowers. The leaves are large, irregular and sharply toothed.

Propagation is satisfactorily accomplished by seeds which should be sown as soon as they are ripe. If prevented from flowering the first spring by removing the flower stems the plants will flower very profusely the second year. During winter the potted plants should be stored in a cold frame, and very early in spring should be brought into the greenhouse for forcing purposes.

Primula cortusoides var Sieboldii (*syn. P. amoena*). A hardy plant though not generally grown in gardens. It is excellent for greenhouse decoration. The flowers vary in color and may be pink, lilac or white. The eye is, however, usually, if not always, white. They are usually from one to nearly two inches in diameter and are arranged in an umbel. The flowering stem is erect. The leaves are coarsely and irregularly toothed, about three inches long and nearly as broad. Its culture is similar to that of Primula japonica.

Porch boxes.

5. Primula Forbesii.

The baby Primrose is an annual with habit something like that of Primula obconica. The leaves and flowering stems are hairy. The leaves are oval-oblong and are sometimes cordate at the base. The flowering scapes are very slender and delicate. The flowers are arranged in umbels or whorls. They are small and of a light or rosy lilac in color. The plant grows from 6 to 12 inches in height and is excellent for edging groups of flowering plants. Being small it is an excellent subject for filling pans. It is readily grown from seeds sown in spring and will flower all through the following winter.

Primula Forbesii, Crimson. This is an excellent variety with ruby crimson flowers, and is said by those who have grown it to be as desirable as the type.

6. Primula kewensis.

A hybrid of P. floribunda and P. verticillata. It has the floriferous habit of the former. Its flowers are, however, much larger and of a deeper yellow, in this respect it resembles P. verticillata. The inflorescenses are quite erect and often attain a height of 18 inches. It is very fragrant, and, therefore, when grown in large batches imparts a delightful perfume to the atmosphere. The forementioned qualities make it one of the best winter flowering Primulas. The plant originated in the Royal Gardens of Kew.

**Primula kewensis farinosa.* Similar to the former except in that the stems and leaves are covered with a silvery white powder.

7. Primula malacoides.

**Primula malacoides.* Discovered in the Chinese Province of Yunnan. A valuable acquisition to horticulture. It is a half hardy or cool greenhouse plant with delightfully perfumed pale mauve or lilac flowers. These are borne tier upon tier along the scapes and form inflorescenses which stand well up above the foliage, the deep green of which brings out in bold relief and enhances their delicate tints. The plant is very floriferous and the duration of its flowering period long. Its height when in full flower is about 18 inches. As a potted plant for winter and spring flowering in the greenhouse or the home it is excellent. The plant is most effective when propagated by seeds sown in spring. It may also be propagated by division.

**Primula malacoides alba.* As the name implies this variety is a white flowered form. In all except this character it is like the type. It may be used as a potted plant or as a subject for filling baskets. As the inflorescenses mature they fall gracefully in feathered sprays and form a perfect fountain of bloom through which the green of the leaves is interspersed in attractive combination.

**Primula malacoides rosea.* This variety differs from Primula malacoides proper in the color of its flowers which are rose-pink in color and of a shade which is quite distinct from the lilac colored ones of the species.

**Primula malacoides superba.* An extremely vigorous and distinct form.

8. Primula verticillata.

The Abyssinian Primrose. This species is half hardy and has sweetly perfumed yellow flowers. The inflorescenses is a scape upon which the flowers are arranged in whorls. The flower stalks (pedicels) are about 2 inches in length. The leaves are oblong lanceolate about 9 inches long and are covered with a white mealy powder. The plant is a useful winter flowering greenhouse subject. Its height is about 15 inches. Propagation is effected by seeds during spring or by division at any time.

**Primula verticillata, Cremona.* In vigor and flower production this variety is apparently more desirable than the species. The flowers are of a pale lemon white and are entirely distinct from those of the former. This plant is exceptionally easy of culture and may become a popular winter flowering plant. It is a seedling of the species and originated in the Queen Victoria Park, Niagara Falls.

9. PRIMULA FLORIBUNDA.

*PRIMULA FLORIBUNDA, (Bundle Flowered). A small yellow flowered plant which grows to a height of about 9 inches. The flowers are arranged in whorls or scapes which at first are erect and later often droop around the plant imparting to it a graceful appearance. The leaves and stalks are somewhat hairy. The plant is a native of the Western Himalayas. It is very effective as a winter flowering greenhouse subject and it lends itself admirably as an edging plant for groups of flowering plants.

**Primula floribunda,* Milky-way. A plant with creamy white flowers, the flowering scapes are not as erect as those of the species although longer. The plant flowers earlier than the type under greenhouse culture and is quite distinct in every way. The leaves are of a light green and are long and serrate at the margins. When in full flower the inflorescenses droop and render the plant very effective. Like the species it may be used as an edger and also for filling baskets or small pans, for greenhouse ornamentation, or for temporary use in home decorative schemes.

The plant occurred as a seedling of Primula floribunda in the Queen Victoria Park, and during three years has come true from seed, thus showing that it is a fixed variation. It may have occurred elsewhere, if so, however, it is apparently not registered, and, therefore, has no prior name.

AFFILIATED SOCIETIES.

C. A. HESSON: In the Province there are now 91 Societies, and out of these 76 have affiliated with this Association some time during the last two years. Of those 76 affiliated Societies, there are 45 which have paid their fees to this Association this year. Out of that 45 we have representatives from 37 Societies here to-day. Those representatives number 81, according to the cards, which have been handed in. The Societies sending in the greatest number of delegates are St. Catharines and Toronto, eight each, Walkerville and Windsor, five each.

A MEMBER: We have for a good many years been having our Conventions in Toronto, and I can see no reason why we should not meet in some of our smaller cities, and see what the Horticultural Societies have been accomplishing. For instance, St. Thomas would be glad to have the Society go up there, and I am sure St. Catharines would, or Ottawa, and let us meet in the summer time, when we could have a couple of days together, where we would not have the distractions of business in the city. A good many of our members take advantage of coming to the city to transact their personal business, and spend very little time here in the Hall. This is only a suggestion. I do not know whether it is constitutionally possible or not.

R. B. WHYTE seconded the motion, and suggested that the next meeting be at Ottawa.

W. B. BURGOYNE moved that the Board of Directors be authorized to take this into consideration, and if a change be deemed advisable to have the summer session in some other town.

J. LOCKIE WILSON: The constitution says "An annual meeting shall be held in Toronto at such time as the Executive shall decide." But if this meeting decides to leave it to the Executive, and give us the power to go out of Toronto, I am sure there would be no trouble about it.

Dr. F. E. Bennett: I think it would be entirely wrong. I know that where other Conventions have gone away from Toronto, and tried other places, the meetings have been a failure. Personally I would like to go to St. Catharines, and also have you come to St. Thomas, but you must have so many delegates in order to get the return trip free from the railways, and that is only possible in places where other Conventions are being held at the same time.

Mr. Burgoyne's motion was carried.

REPORTS OF DELEGATES TO AMERICAN CIVIC ASSOCIATION'S CONVENTION IN WASHINGTON, D.C.

Rev. A. H. Scott. Perth.

Reciprocal relations have been kept up for another year between the American Civic Association and the Ontario Horticultural Association. We are holding our eleventh Annual Convention this year. Their last Convention was the eleventh in the series.

The Convention held in Washington, D.C., last December had a number of attractive features. It was international, for, in addition to the exchanges between their members and the members of our organization here, it was held in conjunction with the Second Pan-American Scientific Congress.

The sentimental feature was noteworthy. Not only did our American friends extend to your delegates a warm welcome, but we felt during a period of war that we had in the convention a company of persons whose sympathies were with the Allies' cause.

The social feature was pleasing. On the evening of Wednesday of Convention week, a reception was tendered to the delegates attending both the scientific congress and the Civic Association. The place chosen for the function was the National Museum. The hosts on the occasion were the Regents and Secretary of the Smithsonian Institute.

A personal touch marked the Convention season, which attracted British delegates particularly. The Earl of Aberdeen, former Governor-General of the Dominion of Canada and Viceroy of Ireland, was the last speaker on the programme belonging to the first session, which was begun with "A Washington Greeting" extended by President Newman of the Board of District Commissioners. Her Excellency the Marchioness of Aberdeen and Temair, at another session, addressed the Convention on our hopes for Civic advance in Ireland. The Aberdeens have some of their household at the war. Some of us have our sons at the war. For this and other reasons the Canadians in the convention were drawn toward the Marquis and Marchioness. The representative of His Majesty at the British Embassy was considerate of the Canadians at the Civic Association Convention. We had an invitation to the Headquarters of the British Ambassador in Washington, and the couple of hours spent with Sir Cecil Spring-Rice and his winsome Lady in their reception room, and around their table, are among the pleasant recollections of the 1915 Convention.

The purposes of the American Civic Association are so akin to our own that it was in line with laudable ambition to carry out the programme successfully. There were five general topics treated—National Parks, Community Centres, City

Planning, Industrial Housing and Country Improvement, the last including Landscape Extension Service and a System of Highways and Landscape Designing.

The organizations that contributed to the Convention, and that brought special greetings, were the General Federation of Women's Clubs, the National Municipal League, the National Conference on City Planning, the American Forestry Association, the American Society of Landscape Architects, and the Ontario Horticultural Association.

It fell to me to speak for you, and for this Association at the opening of the Convention. My greeting was as follows:

"I stand officially to-day for three. When you regard the situation in a manner that is not strictly official, I stand for more than three. For we three who have

Foxgloves.

come down to you have left behind us in Canada fourteen thousand whom we represent, fourteen thousand Canadians who are, I think, as fine a lot of men and women as can be produced in any country under the sun.

"We greet you this morning. We entertain the most delightful feelings towards you, and towards the interests that the American Civic Association stands for. They are akin to the interests that are represented strictly and scientifically by the Ontario Horticultural Association.

"I do not need to teach geography to the members of the Convention. At the same time I have found myself, in days gone by, in at least two situations that were somewhat peculiar, and I had to meet my own personality on each of these occasions. A number of years ago I was a traveller through bonnie Scotland. It was on a steamer on Loch Lomond that I fell into conversation with a very beautiful looking lady, well-dressed, and as she told me afterwards, intelligently conversant with all parts of the world. When my steamer companion came to know that I was from Canada, she looked me over from head to foot, and because I wore neither fur cap nor coon overcoat she doubted, as I thought, that I was from Canada. But after

I had taught that lady some geography, and had instilled into her Scotch mind some important facts for a Britisher, when I bade her good-bye at Balloch, she said that she was very pleased to meet a Canadian, and she said further that she would bring out her geography when she got home, and she gave me still further the assurance that from that day until some indefinite period she would take more interest in Canada.

"Under the chairmanship of Lord Kinnaird, away up in Christiania, the capital of Norway, it fell to me, as a member of a Convention that was held there, to deliver a short address on Canadian things. Lord Kinnaird asked me privately before I was introduced, if I would put in a word on a certain matter that had a bearing upon my country, for he said that the people who are to listen to you are not as well posted on Canadian matters as they should be. At the close of my address a certain gentleman, not from the Scandinavian country, but from elsewhere, called in question some of the statements that I had made. So there again I found that I had to explain who I was, and give certain details about the country from which I came.

"If you start at the Pacific Ocean and come eastward you will find the Provinces of British Columbia, Alberta, Saskatchewan and Manitoba to the west of my Province. If you start at the Atlantic Ocean and come westward you will find in Eastern Canada, Cape Breton Island, Prince Edward Island, Nova Scotia, New Brunswick, and the Province of Quebec. Centrally situated between these divisions of the Dominion of Canada, there is a little country, a Province, extending from the Prairie lands and the great waters at the north and the north-west to the scenic beauties of those great fresh water lakes that are your glory as well as ours,—that strip of country extending southward until it meets the boundary between your Republic and our Dominion, is the Province of Ontario.

"I dislike to have others speak boastfully in my ears, and I guard myself against speaking egotistically about myself or my own, but I do say in all sincerity, and with the knowledge I have of a good portion of this old earth of ours, that I believe in regard to its people, having respect to its outlook, considering its physical features, noting its form of Government, and placing emphasis upon the intentions of our people as a whole that there is no better part of the world than the Province that sends to you this greeting this morning.

"We are not what we ought to be. We are not what we hope to be. But, associated with a people who stand for the interests represented by the American Civic Association, we are a people who seek to move on to higher and better things. Among our enterprises, which are growing and already numerous, is the Ontario Horticultural Association. I do not think, when you come to Canada that you can see any finer things, in certain lines, in your own country than you will find with us. When you are attracted by beautiful rivers and varied scenery, and roses with fine aroma, and apples like the McIntosh Red, the Fameuse, and the Spy, and gardens that are improving as the days go by—I think that here are interests that impress visitors from the United States of America, who come up to the country that brings to you this greeting to-day.

" Now there is one thing that you will grant me liberty to state in the greeting that I am privileged to convey. I should have pleasure in saying many things that there is not time to say. But may I say to you, as my personal friend, and to those over whom you have the honor to preside in this Convention, that there is one thing that makes a gathering of this kind particularly interesting to me; and I think too, particularly interesting to the people who speak through me when we bring this greeting to you.

"'The greatest enterprise in the world' says one of your own writers 'for splendor, and for extent, is the up-building of a man.' Another of your writers puts it in this way 'The crowning glory of any city is its men, who make every other excellence possible.' You have certain things in the United States of America that you are sorry to have, and that we in a younger country are striving to keep away from our borders. And you have things down here, because you are a hundred years older than we are, that we are striving to emulate. I see some of these as I visit your capital again, and I have felt some more of them every time that I have returned to Canada after attending a Convention of the American Civic Association.

"It seems to me that we who take part in this Convention with earnestness will go back to our Provinces and States seeking to impress our people that it is not our railroads, it is not our acres, it is not our physical features, nor is it any one or more of many other things that will make us a great people. But it is that righteousness that exalteth a nation, and that manhood and womanhood of worth that will build us up, and make us respectable in our own eyes, and in the eyes of the other nations of the world.

"Because I feel that this is the climax that we are seeking after, I express it in my greeting, and hope that you in your country down here with the larger population, and we, along with you, a developing people in the Northern borderland, may be blessed by that great Master, whose we are and whom we serve, so that physically, economically, industrially, religiously, and in every honorable way we may contribute to make this continent the praise of all the earth."

MRS. CADWELL'S REPORT.

As one of the delegates from the Ontario Horticultural Convention, I wish to make the following report, because I am sure that our directors are all anxious to know something of the work of the American Civic Association with which our Provincial Society is affiliated.

One of the dominant features was "Enthusiasm." I think that I as well as the other two directors, who accompanied me caught the spirit of the convention, and we shall endeavor to impart it to the other directors, and all working together we hope this year to show by our united efforts as the results, a cleaner and more beautiful city.

On Monday, December 27th, the delegates to the American Civic Association Convention were invited to a "State Reception," given to the delegates of the Second Pan-American Scientific Congress. In the absence of President and Mrs. Wilson, Secretary of State and Mrs. Lansing and Judge Gray received. It was a very pleasant function and enjoyed by all.

The convention opened on Tuesday, December 28th, at 10.30, the chair being occupied by Mr. R. B. Watrous, Secretary, as the President had not yet arrived. Rev. A. H. Scott, Perth, gave the invocation. We were welcomed to the city of Washington by Hon. Oliver P. Newman, President of Board of District Commissioners, Washington, D.C. The city has Commission government, with three commissioners, who act in conjunction with congress. Mr. Newman gave us a hearty welcome.

All the affiliated clubs then presented their greetings. On behalf of General Federation of Women's Clubs, Mrs. Percy V. Pennyback, President, Austin, Texas, spoke briefly on their line of work.

Greetings were extended by the National Municipal League, the National Conference on City Planning, the American Forestry Association, the Ontario Horticultural Association and the American Society of Landscape Architects. Their representatives told of the different lines of work, aims and purposes, to ameliorate living conditions of the American people.

Lord Aberdeen, formerly our own Governor-General, and Viceroy of Ireland, gave us greeting and told some reminiscences as a Viceroy.

German Iris.

At the evening session, the President, Mr. J. Horace McFarland, Harrisburg, Pa., gave his annual address, choosing a very appropriate subject, "What shall we do with Niagara." He stated that the United States and Canada should work together to preserve Niagara. Our own Government as well as that of United States received a great deal of criticism in connection with the Hydro-Electric question.

Mr. Enos Mills, spoke on National Parks and preparedness. He said that National Parks tend to unify the people, by travelling and recreation, and inspire patriotism to live better and enjoy them, which is better than to die for them.

Mrs. Jno. Dickinson Sherman, read a paper on "Woman and Woodcraft." She said that Parks in the thickly populated country tend to decrease vice, and that association with nature is a benefit to children which stays with them all through life, teaching them lessons from birds and flowers, and the living presence of trees. It is the greatest influence outside the home.

The address by Mr. G. H. Grosvenor, Director National Geographic Society, Washington, D.C., on the "Need of National Parks," was very good. He pointed out that if people would spend more money at home the country would have better parks. On account of the war they would have to travel in their own country, which from that view point was a good thing.

Mr. R. B. Marshall, General Superintendent of the National Parks, Washington, D.C., told us—"What must be Done for Parks." One of the things in which people could help directly is in buildings, to have them built so as to harmonize with the beautiful surroundings.

Mr. R. B. Watrous, Secretary, read a paper on "A National Park Service, What it Proposes." He told of the efforts to secure the fourteen National Parks, which contain five million acres. He pointed out that besides the pleasure to the people these Parks were a valuable asset from a business point of view. In these fourteen National Parks in different states there are thirty-one national monuments representing an enormous outlay, but that they did not regret the investment, as every day thousands of people are enjoying them to the fullest extent.

Mr. Robt. S. Yard, of the Department of the Interior, gave an illustrated talk on "Our National Parks."

President McFarlane presided at the business session, when the report of the Secretary was read by Mr. Watrous. It mentioned the various activities of the society during the past year. The Treasurer's report by Mr. W. B. Howland, President, The Independent, New York City, showed a deficit of a little over a thousand dollars.

The report of committee on nominations was heard, the officers and directors, with one or two exceptions to be the same as previously.

Mr. E. L. Millard, Chicago, Ill., read a paper on "Present Legal Aspects of the Bill Board Problem." This was one detriment to civic improvement work that was strictly in the hands of the Board of Control in any city if they must have bill boards, to specify a certain district and confine it to that section only.

Mrs. I. B. Oakley, had a splendid report on noise nuisance, stating that Baltimore, Md., has the only noise policemen in the world. Dogs and cats seemed to have more privileges than people. The old saying might be changed from "Love your neighbor as yourself and keep your alley clean," to suit this, as "Love your neighbor as yourself and keep your dog and rooster still." Another menace was auto horns.

Mrs. Elmer Black, New York, read a paper on "Markets," which was very interesting.

Miss Margaret Wilson, daughter of President Wilson, addressed us on "Schools as Community Centres." Miss Wilson is deeply interested in this work, and introduced Prof. E. J. Ward, of Madison, Wis., who spoke on "Community Centre Organization for National Defense and World Adjustment." This was very good and practical as well.

Dr. Chas. North, Director Northern Public Health Bureau, New York City, gave an illustrated talk on a community centre at work.

Mr. R. Crist, Deputy Commissioner Bureau of Naturalization, told of the Relation of the Public School, the Community Centre, and the Federal Bureau of Naturalization in making new citizens.

Lady Aberdeen told of "Some of the Hopes for Civic Advance in Ireland," of how Mr. John Nolan, Vice-President of the American Civic Association, had gone over to Ireland and helped plan the work, but they had just made a fair start when the war broke out, and all work was suspended.

"City Planning," by Mr. F. Olmstead, Brookline, Mass., was very good, and was followed by Dr. Jno. Nolan, on "Aspects of Land Subdivisions." He said that every subdivision should be planned with a small park and boulevards.

"Rural Hygiene," by Dr. J. N. Hurty, of Board of Health, Indianapolis, Ind., was very instructive.

Mr. McFarland, President, read a paper, the "Human Side of City Planning," handling it in his usual able manner.

Mr. Watrous, Secretary, followed up with "City Planning Administration," showing how this subject could be handled in a very practical way.

"Industrial Town Development," "Housing Safeguards," "Planning for Mushroom Industries," and "Planning for the Small Town," were other subjects discussed.

Prof. H. R. Francis, of the New York State College of Forestry, Syracuse, N.Y., told "How New York educates its people through the Landscape Extension Service."

"A National System of Highways and Landscape Designing," by Mr. C. Kehr, Knoxville, Tenn., was very good.

At the close of the convention all felt that they had received a great deal of help by way of encouragement and enthusiasm, both of which are great factors in the success of any venture either great or small.

TULIPS.

Dr. D. Clark, Grimsby.

In treating of tulips, I propose first to give a brief history of the flower, after which I will speak on the various types, giving a short list of the varieties which I would recommend to grow. This list is of necessity arbitrary, and personal taste will naturally cause me to discard some which others would include and *vice versa*. Afterwards I will give my ideas on culture very briefly.

For the historical portion of this essay, I propose to quote from Rev. Joseph Jacob's very interesting little work on the tulip.

1554. With the possible exception of such species as T. Sylvestris and T. Celsiana, tulips were unknown in England and Western Europe up to this date.

1559. The Swiss botanist, Gesner, saw some tulips in a garden between Adrianople and Constantinople.

1561. The first picture of a tulip of which we have any record was published in this year.

1562. A merchant at Antwerp receives a cargo of bulbs from Constantinople.

1571. Introduction of tulips into Holland.

1582. A few years before this date tulips were introduced into England.

1611. Tulips first flowered in France.

1629. Parkinson enumerates about one hundred and forty varieties showing that tulip culture had gained a firm foothold in England.

1634-37. Period of the tulip mania in Holland.

1665. First double tulip noted.
1690. Parrot tulips first noted.
1792. A catalogue of James Maddock issued in this year contains 665 varieties, priced from 6d. to £6 6s. per bulb.
1822. New species of tulips found near Florence.
1872. Tulipa Greigii found in Turkestan.
1889. Darwin tulips introduced into commerce.
1902-4. Many fine, new species from Turkestar, Bokhara, Persia and other countries were introduced by C. G. van Tubergen of Haarlem—T. Fosteriana, T. ingens, T. Tubergeniana, T. praestans amongst others.

It would hardly be fair to pass by the Tulip mania of 1634-37, by a mere mention of the fact, as this is, without a doubt, the most unique and extraordinary speculative mania which history records. The advent of such a flower from the east naturally created excitement among garden-lovers, and the desire to possess some of them together with the limited supply soon caused prices to soar. In many instances thousands of florins were paid for a single bulb. Rich men in France and Germany were just as anxious to possess them as the Dutch, and so prices continued to soar, or were at least maintained. About this time it became the fashion in Paris for ladies of the higher classes to wear flowers, especially tulips, in their low-cut dresses. Naturally this was the signal for the wealthy beaux to strive to obtain the rarest and most costly specimens to present to their lady friends. This gave an additional impetus to the already abnormal trade in bulbs. Up to this point the trade was perfectly legitimate, following the law of supply and demand; but as time went on it became a pure speculation, when the last thing that entered the purchaser's mind was the wish to possess the bulbs, he had theoretically bought. All sense of reality was lost. This is proven by the fact that long before the end came in 1637, bulbs were bought by weight without regard to their size. It is not very clear what was the cause of the sudden fall, although it must have crossed the minds of the more far-seeing speculators that such an artificial trade could not go on forever. They began to make stipulations with the result that confidence was lost, and the inflated values dropped like a stone. The law courts became crowded. A Commission was appointed to endeavor to bring about an agreement between the parties. This Commission reported in May, 1638. Afterwards the trade resumed its normal course, and the famous Tulip mania came to an end.

VARIETIES OF TULIPS.

Bulb catalogues usually classify tulips as (1) Early Singles, (2) Early Doubles, (3) Late Doubles, (4) Rembrandts and Bizarres, (5) Cottage Garden, (6) Darwin, (7) Parrots, (8) Species.

In giving lists of good varieties to grow, I will confine myself simply to the names without description. Your catalogue will usually supply a full description.

My experience with early singles has been very limited, as also with doubles. Early singles have always been the great standby for early bedding. There are many beautiful and distinct varieties which can be combined to give very pleasing effects. As a general rule, unless the weather is distinctly cool and cloudy, they do not last as long as the later varieties. They also lack length of stem for cutting purposes. A fairly good list would include of course, the Duc van Thols for very early, followed by Prince of Austria, Cottage Maid, Flamingo, Queen of the Netherlands, Couleur Cardinal, Jenny, Grace Darling, Proserpine, Sir Thomas Lipton, Duchesse of Parma, Lady Boreil, Keizer Kroon, President Lincoln, Princess Helene, Pottebakker White, and Mon Tresor.

I have to confess that I planted only double tulips once, which is certainly not a fair test. They were planted in a perennial border, and the first year gave very gratifying results. That summer it was so hot that the bulbs were partially cooked in the ground, and the following spring they were almost a complete failure. I am free to admit that I am prejudiced against almost any double flower that is naturally single. However, these were certainly fine the first year. As nearly as I can remember this is the list: Couronne d'Or, Toreador, La Grandesse, Murillo, Couronne des Roses, Imperator Rubrorum, Tournesol, Lac van Haerlem, La Candeur, and Rose Blanche. Schoonsord is another variety highly recommended.

Late doubles I have never grown, so am unable to give any opinion. Blue Flag is a variety which is very highly recommended by some of my friends.

Well-kept Hamilton lawn.

Rembrandts and Bizarres are both what are known as broken Darwins, that is striped; the former usually with a white ground and flamed pink, crimson, scarlet, etc.; the latter with a yellow ground and flamed with various rich shades of brown. They all look very much alike to me, and personally I prefer the solid colors of the Darwin and Cottage varieties.

Among the Cottage Garden tulips there is the greatest possible diversity of color, shape and size. The range of color extends from almost black to the purest white, with yellow predominating. Blue is a color that is almost entirely lacking. A great many of them are of a very beautiful form especially the vase-shaped varieties with long recurved and pointed petals, also the long ovals. They vary greatly in size and height. I have some that are no taller than an early tulip, while others attain a height of about 28 inches. I should think the average would be about 2 feet, possibly a little less. Several of them such as Golden Eagle, and

Fulgens Lutea are as fragrant as a rose. For some reason almost all the fragrant varieties are yellow. I grow about sixty varieties of which I consider the following the best: Apple Blossom, Avis Kennicott, Bouton d'Or (small), Crested Crown, Cyclops, Elegans, Elegans Alba (my favorite of all my tulips), Fairy Queen, Flava, Fulgens, Fulgens Lutea, Gesneriana Aurantiaca, Gesneriana Aurantiaca Maculata, Gesneriana Lutea, Gesneriana Spathulata, Golden Crown, Golden Eagle, Inglescombe Scarlet, Inglescombe Pink, Inglescombe Yellow, La Merveille, Lady Roberts, Moonlight, Retroflexa and Vitallina. It is a great pity that so many tulips go under different names, in fact, they sometimes have three or four. I quite agree with Mr. Jacob when he says that the aliases that some flowers have to support would do credit to a hardened criminal.

We now come to my own pet hobby, the Darwins. I have always claimed that those who have not grown or seen the Darwin do not know what tulips are. I admit this is purely personal taste, but when you consider their cutting qualities, their lasting qualities, and their glorious colors which comprise every conceivable shade between black and white, I think I am to be pardoned for my preference. Their great length of stem lends itself to cutting and I think there is no doubt that a long-stemmed flower can be more artistically arranged than a short one. I grew this year 125 varieties, none of which were under 23 inches in height. Many were 30 inches and a few grew to be 36 inches. I know of no flower with the possible exception of the chrysanthemum and the carnation that can compare with them in lasting qualities when cut. With special care they are good for two weeks and over, and in almost any light and atmosphere they last ten days. Last year I cut some when they were past their best on the 11th of May and put them in cold storage to see what they would do. About the end of July, fully eight weeks after, I thought I would go and see them. I took some of them out and did the worst thing possible with them; that is, carried them in my bare hand for over a mile in the broiling sun. They were put in water when I got home and after being cut eight weeks were good for five days. The colors are simply indescribable, and, as I said before, they comprise every imaginable shade. All that I have seen are good, but the following I give as being very desirable: Angelina, Auber, Baronne de la Tounage, City of Haarlem, Clara Butt, Dorothy, Dream, Edmee, Electra, Ethel Roosevelt, Europe, Flamingo, Giant, Glow, Gustave Dore, Harry Veitch, Isis, La Tristesse, La tulipe noire, Loveliness, Maharadja, Margaret, Melicette, Millet, Mr. Farncombe Sanders, Mrs. Potter Palmer, Night, Nora Ware, Pride of Haarlem, Princess Elizabeth, Psyche, Rev. Ewbank, Suzon, Turenne, Velvet King, Violet Queen and Zulu.

Parrots have been in existence since 1690, and it is a wonder that there are not more varieties. When you consider that they are peculiar sports from other varieties it is not to be wondered at so much. They are practically all Bizarres, and when seen in mass have a peculiar barbaric splendour all their own. The weak point in Parrots in my opinion is that they have a rather slender stem, which with such enormous flowers causes them to frequently go down. For some reason mine stood up particularly well this season, although they went through three perfect cyclones of wind and rain followed by a very hot sun. There are only a few varieties catalogued (about ten) and all cheap except Sensation, which I could not afford to buy at $25 per bulb.

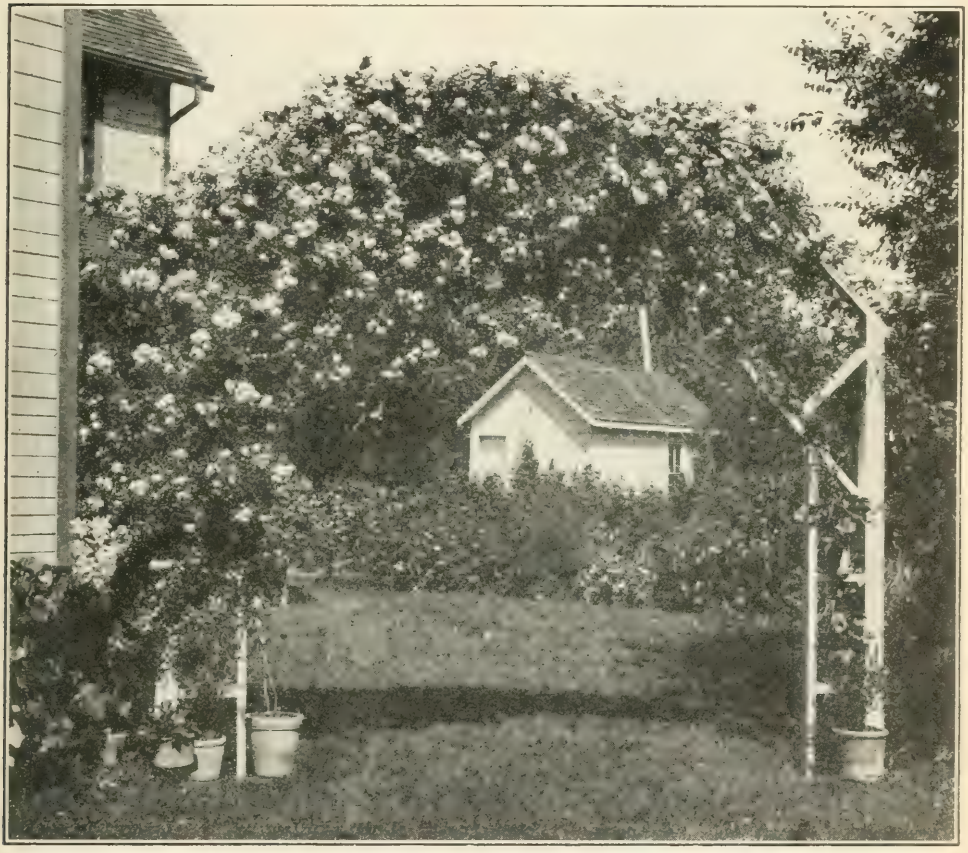
Most of the botanical species which I have grown are quite small although very beautiful. Some such as T. Celsiana, T. Kaufmanniana, T. Margiolletii, and T. Turkestanica have flowers that are not much larger than a large Hepatica, while

others like T. Greigii, T. Oculis Solis and T. Praestans have large showy flowers which would be quite suitable for bedding, especially the latter, as it has several flowers to a stem. I do not imagine they will ever be grown very extensively except by those who wish to have something rare. When looking at them my imagination is liable to wander and instead of the flowers I see the wild uncivilized peoples who first saw these wondrous creations of nature in their native habitat in the mountains of Central Asia, which, till very recent years had been a sealed book to western civilization. They do not all come from Asia, but a great many of them do. Some are from the Balkans and Italy and some from the south of France. I know of no American native tulip.

Culture of Tulips.

With regard to the culture of the tulip it is needless to say that the soil should be worked loose to a sufficient depth for the roots to penetrate. I know nothing about the working of clay or other heavy soils. On mine, which is almost pure sand, you can work at any time it is fit to be out of doors. The consequence is I do not have to consider the question of drainage. Here I would warn everyone that tulips do not like wet feet; that is, be compelled to stand in water, although they like plenty of moisture. They should get the full sun in a position reasonably sheltered from strong winds, especially the taller Cottage Garden and Darwin varieties. Personally I think all tulips look better in mass although both Darwin and Cottage Garden are very useful and beautiful as clumps in the perennial border. Planting time should be governed largely by locality and climate. Here, any time in October or early November should do; the earlier the better if it doesn't interfere with other bedding plants. The latest I ever planted bulbs was December 10th by the light of a lantern. Next morning the ground was frozen solid and did not thaw out till spring. I didn't see any special difference in the flowers. This is a practice that is not to be recommended, as the bulb should make root growth before freezing. If the bulbs are to be lifted four inches is deep enough. I do not believe in asking a bulb to exhaust itself in the effort to reach the light and air. Six inches apart each way is about the right distance for mature bulbs. Some of the smaller early varieties might be given less space. As to the method of planting I favor the trowel as opposed to the dibble. I am unalterably opposed to the dibble as a means of planting tulips. They are almost sure to be more or less hung-up instead of being fairly placed in the bottom of the hole. This year mine were practically all trenched in as it is much quicker and equally good. To do this you open a trench to the required depth and place your first row of bulbs. The earth from the second trench fills the first and so on as far as you wish to go. The bulbs being planted, the question arises should they be protected. To the majority of people I answer, no. Why? Because these same people would not remove the protection early enough in the spring. My advice is to protect if you wish, but be sure it is removed before the frost is out of the earth in the spring, otherwise you will have plants that are liable to be bleached and twisted in their endeavor to grow through the protecting medium. If they should come up in a January thaw, do not worry. I have had them actually green in January followed by 10 degrees below zero, but I could see no difference in the bloom the following spring. I believe in keeping the soil loose around the plants after they come up in the spring. The best instrument I have found for this purpose is a little three-toothed cultivator with a handle like a hoe. These teeth

are removable. When the plants show nicely through the earth I take this cultivator and remove the middle tooth. With the remaining two teeth you straddle each row. The first cultivation is done very lightly merely breaking the top crust. In a few days you can repeat, going a little deeper each time. After the plants are too large to straddle with safety I replace the middle tooth and remove the two outer ones, when you can go almost as deeply as you like with the middle one alone. I would say that to attain the very best results tulips should be lifted every year. If circumstances prevent you from leaving them till they are thoroughly ripe, as I do, then you may lift them green and put them away in



Dorothy Perkins Rose arch in garden Wm. Hartry, Seaforth.

some unused corner till they are ripe, after which you can take them up and store in some dry place till planting time comes again. It is unreasonable to expect bulbs treated in this way to be just as good as if they had been left undisturbed to ripen in the natural way. To the man who wants the very best results and who can afford it, my advice would be to buy new, well ripened and mature bulbs every year. If you can't do this, then follow the lines indicated above. Some claim that certain types of tulips do as well when left in the ground year after year. Perhaps they do. To me what takes place resolves itself into a very simple problem in mathematics, if they are left undisturbed. As even the smallest offset multiplies it can't be hard to imagine what is taking place.

To complete a paper which has already become too long I will give a brief summary of the principal points to be remembered. Plant where there is no stagnant water. Plant in a dry sunny position protected from wind. Plant early and if possible do not plant two years in succession in the same ground. Take up bulbs every year. Store bulbs in a dry and airy storeroom. Don't dig in fresh manure, which means ruin to bulbs if it touches them. Do not protect unless you are sure to remove early enough in the spring.

I will now conclude with a plea for the tulip on account of its cheapness in most instances, its season of bloom when other flowers are scarce, its accommodating nature to all kinds of soil and culture, and lastly to its exceeding beauty of form and color.

Mr. Sinclair: I am a lover of tulips and of spring flowers. I do not think there is anything which quite fills the place of the spring flower in the garden. After the winter, when the early spring flowers come, is the one time in the year when the flower lover really enjoys himself, because it seems to be what you have been looking for for several months, and tulips I think are the very perfection of the gardener's joy, when the tulip time is on. I have been about four years growing tulips, but the bulbs have increased to such an alarming extent that I do not know what I am going to do with them next year. I think I have 400 varieties of different tulips, and in a small garden it is hard to find room for them all. The last speaker said that he thought it was necessary to dig them up every year. I would rather leave them in for two or three years than take the chance of having the bulbs rot.

I have had splendid satisfaction with Darwins. With sandy soil I have put in a little manure and they have had the benefit of the spring rains. We had the pleasure of winning Dr. Bennett's cup in Tillsonburg and are going to make a run for it again this year.

There is a large part of the country that is not covered by your Societies and that is the rural communities. I am trying to get the farmers to beautify their places and grow tulips and other flowers. I think the local Horticultural Societies can do a great deal by extending their limits out into the country. This year I have been trying it out through school sections. I am starting in with eight school sections through Oxford County, giving them perennial beds and also tulip beds in the spring. I think that through the school sections we will probably get to the parents and the farmers out through the country.

I cannot see any reason why our rural Ontario should not be just as beautiful as rural England. We can grow everything they can out there, and a great many things with less pains than they can, and when citizens spend $500 an acre to grow things on I do not see any reason why the farmer with land at $100 cannot grow flowers just as well. After you go back to your Societies that is one thing that you can take into consideration with your work—to encourage the growth of flowers in farming communities.

Prof. Crow: The last speaker has brought up a most important point. I would like to have you consider this idea of educating the rural communities to beautify their surroundings.

PROTECTION OF BIRDS.

J. J. Kelso, Toronto.

I have been delegated by the Canadian Society for the Protection of Birds to come here this afternoon and tell you something of what is being attempted and to ask for your co-operation. This subject was brought up yesterday, but the Society is anxious you should know just exactly what they are trying to accomplish. One of the first things is to educate the public to the value of birds. To this end pamphlets on "The Value of Birds to Man," by James Buckland, are being distributed free all over the Province. Then we have encouraged the building of bird houses, and we are having the houses made in the Manual Training Classes and in the Technical School, and we hope to send out thousands of them. There have been posted up all over the country 10,000 circulars asking people to take an interest in the insectivorous birds of the country, and we have also sent out notices and warnings not to disturb birds' nests. Then we have every fortnight or so a lecture or talk by men who are students of birds, and are able to give information on them. The question of cats was brought up yesterday. We do not believe it is wise or reasonable to talk of the extinction of the cat, because the cat is a very valuable animal and has a distinct value in life, but we do advocate that cats should be limited as to their families, and we are trying to reduce their supply. You may be interested to know that the Humane Society put out of existence, in a painless manner, 4,000 cats last year, and there are several thousands still who ought to share the same fate. A gentleman just told me he had abolished the cat around his place, and within a month the place was overrun with rats. He secured another cat and got rid of the rats. We must realize that the damage done by rats would be as great, if not kept down by cats, as the harm done by insects were it not for the birds. Householders should feed their cats, because if they are not fed they will eat birds for a living.

LANDSCAPE GARDENING AND IMPROVEMENT IN SURROUNDINGS OF SCHOOL GROUNDS, ETC.

A. H. Tomlinson, O.A.C., Guelph.

I was much interested in what Mr. Sinclair said. That is the kind of work my department is trying to undertake. I will be pleased on receiving requests from any country district, society, farmers' club, the school board, trustees, or people who have homes, to visit that district, give advice, make recommendations, take dimensions, etc., and later send plans. We hope also as a part of our work (although as yet we are hardly in the right condition to take hold of it) to be able to take to all the country districts where people want it, a number of slides, which we hope to reproduce from our photographs, so that we may be able to educate the country people in the art of beautifying home surroundings. We are glad that the cities are doing so much, and it is most gratifying to see a number of the Horticultural Societies doing such fine work. The city sets the pace for the country. Even in London the country people who visit that city make a specialty of visiting the parks, and they never forget the sights they see in those parks. If we make our cities as beautiful as we possibly can, beautify home surroundings, parks,

Booth at the Windsor Society's Flower Show.

gardens and cemeteries and vacant lots, that will inspire the country people to do likewise. I would suggest that the work in cities be done as correctly as possible; that is, where possible, the Horticultural Society may see fit to ask the advice of an expert. In Ottawa or Guelph our work is somewhat limited. We are supposed to handle rural work alone. The city work we are at present unable to handle.

A MEMBER: You are available for rural Horticultural Societies?

A. H. TOMLINSON: Yes.

MRS. CADWELL: Would you be available for the Windsor Society?

A. H. TOMLINSON: No.

THE CHAIRMAN: There is no reason why his services should not be available to every municipality. We plan our parks in a haphazard manner and this Convention should pass a resolution asking the Government that the services of Mr. Tomlinson, and any others that they might add to the staff, be furnished to the Horticultural Societies, and to any municipality who wish the services of a landscape gardener to beautify their parks.

PROF. CROW: Mr. Tomlinson and the rest of the department at Guelph are all very much interested in horticulture, also floriculture. We think that the work of the Horticultural Societies is bringing very good results. I should esteem it a very great favor if this Convention could see fit to discuss a little further the rural aspects of horticultural work. My own opinion is that work done in the town is the very best that could be done for the country district, because our country people get their ideas of shrubs from the towns they visit.

DR. F. E. BENNETT moved that the Board of Directors wait upon the Minister of Agriculture, asking that the services of landscape gardeners be available for all municipalities. Carried.

EVERYONE'S GARDEN.

W. WHITE, KINGSTON.

In these days of calamitous happenings when the war clouds are enshrouding the land, it seems, at first, odd that some people should gather together to discuss, among other things, such a simple and ordinary matter as the growing of flowers. But flowers are associated with every phase of life, and the lives of those who are fighting our battles are no exception.

We see battalions decorating their lines with flowers, each competing with the other for the best display; we see one of the English regiments with a rose for its crest, and we see the last resting place of the departed warrior kept green and fragrant with the subject of our discussion. The very ground that is now being fought over no doubt in previous years contributed seeds to our gardens. Moreover, and most important of all, if there were no flowers there would be no fruits or vegetables.

We, who are trying to inculcate in our neighbors a love of flowers, have no excuse for our vocation or avocation. As a business it is honorable and fairly remunerative, and as an avocation it is all absorbing. The more converts we can make the better for our land. Abroad the world has not forgotten Gladstone's famous reference to Canada as "A land of perpetual snow and ice." and we ought to be able to make future English premiers refer to Canada as "A land of sunshine and roses."

"A garden is a lovesome spot," says Sir Thomas Browne, and one may have a garden as elaborate as one feels inclined. If one has the means he may emulate Right Hon. Joseph Chamberlain and pay as much as $500 for a single orchid. One may erect costly conservatories and import rare and exotic plants. In a conservatory in Highland Park, Rochester, N.Y., I saw a collection of rare flowers such as I have never seen before—rare ones from the tropics, plants mentioned in ancient Greek history, and flowers of the strangest colors and equally strange habits—and they form a grand collection and well worthy of a visit. Each plant is labelled with its Latin name and the common equivalent. By the way, although Rochester is now called the "Flower City" in the early days it was known as the "Flour City." It was the chief settlement of a farming community, and there the early settlers took their wheat to be ground into flour.

As I said before, if one has the means he may go to almost any extreme in gardening. He may have imitations of the sunken gardens of Italy, the rock gardens of Japan, the geometrical gardens of Versailles or the paved gardens that go with the famous country houses in England. Most of us get our love of gardens from England, and most of our horticultural experts are either of British birth with an innate love of flowers, or have visited the old land and there had their enthusiasm quickened.

Gardening has quite a literature. Most of it refers to English gardens, but it is my experience that one season of one's own experience will give one more knowledge than he will obtain from a lot of books. "Buy Hyacinths and feed your soul," was Mahomet's advice to his followers, and some now feed their souls with imported roses and pæonies and some of the other queens of the garden. And it is all good and worthy. But the average city lot dweller who is an amateur at growing things feels that he would like to start with something less pretentious, something that will only take a portion of his time, is inexpensive and will give him a bouquet for his table, or a nosegay for his buttonhole.

Some of the permanent gardens once established are inexpensive and provide the above things. In an old lady's garden near here I once saw a great display of golden glow, perennial phlox, orange lily and hollyhocks, all blooming together, perhaps fighting each other; but they looked well and repaid the old lady for the time it took to bring them to a head. Another one I know has a magnificent bed or garden of Kaiser Kroon tulips. When these are done he plants pansies or begonias. But this is expensive.

My garden last summer was nothing but a border of annuals, such as even a child might grow, such as the busy housewife of a large family might find not too onerous, and such as an old person might have pleasure in. They will grow anywhere—I mean in any kind of ground—with a little stirring. It gave me delight, and I have no other excuse for these few lines, but to pass my experience along to other amateurs like myself. Of course, it would need variety each year to rekindle interest. My garden consisted of masses or groups of these annuals and nothing else: Coreopsis, Phlox, Calendula, Larkspur, Zinnias, California Poppy, Cosmos and Bachelor's Button. Here and there I planted a Gladiolus. Some say better results are obtained where these are brought into color combinations, but I have a fondness for grouping or planting in masses. To my mind it seems that all flowers look better in masses—it seems to accentuate the beauty of even the humblest annual. But plant them as your fancy pleases. They are all "old reliables" and almost "fool proof." Make a plan and follow it and do not try the hit or miss way of doing things. You may start this garden of annuals in May

and when the 12th of July has rolled around you may, perhaps, be wearing some of the flowers. Do not plant the seeds too deeply and late in the afternoon water them. Use the early flowering Cosmos and do not allow the cornflowers (Bachelor's Button), or almost any annual to go to seed.

These annuals may be planted and adapted to almost any available area of space. They will bloom a long time, many of them until frost, and if they give you as much pleasure as mine did I shall feel rewarded for the time I have spent in writing these lines.

NATIONAL ECONOMY THROUGH THE HOME PRODUCTION OF GARDEN FOOD.

By Geo. Baldwin, Toronto.

As the war between our Empire and its Allies on the one side, and our powerful antagonists on the other has developed, our nation has come to recognize that it is no ordinary struggle in which we are engaged. A general demand has arisen for national economy and the careful conservation of all our resources. The question, How can the land be made to yield its utmost at the present time? is on every lip, and the Toronto Vacant Lots Cultivation Association in co-operation with the Rotary Club of Toronto is making strenuous efforts to solve it. In times of scarcity all who have leisure, or hours for recreation, ought to be taking part in the production of food. This may be done by amateurs as well as professionals. Hundreds of thousands of people make gardening a hobby, and in this case the hobby may be made to yield wholesome and delicious food, thus proving to be of real economic value. The productiveness of existing kitchen gardens may be increased by scientific methods of cropping, tilling, and manuring. There are hundreds of acres of land marked off for sale as building plots which are now no more than a wild, thick with weeds. By cropping every yard of ground which is not serving a definite purpose vast quantities of food can be produced. A movement of this kind, supplemented by a revision in meat-eating habits, would raise the spending value of the dollar and probably improve the health of the people. A tendency to elevate the importance of vegetable food is always apparent. A small piece of ground yields at a higher rate than a large one, because of the greater concentration of labor which is applied to it. Having this in mind we should try to induce intensive cropping in backyard gardens and vacant lots in every city, town, village, and hamlet in Ontario, and this address will give some idea of what is being done along these lines in Toronto as an incentive for others to emulate.

In the spring of 1915 the Toronto Vacant Lots Cultivation Association and the Rotary Club Vacant Lot Cultivation Committee, copying the example set by Philadelphia, started with 75 gardens each which proved a phenomenal success and warranted the endeavor to enlarge their efforts in 1916, which they did to the extent of 300 gardens between them. In the fall of 1916 at a joint meeting of the directors of these two Associations it was unanimously decided to amalgamate and thus avoid overlapping. It is the intention of the joint Associations to have upwards of 500 gardens in 1917. The work of the Association, which is composed of a president, two vice-presidents, a treasurer, secretary and superintendent, and a board of fifteen directors, is carried on as follows: Our first action is to write

real estate owners for the free use of vacant land, conditionally that the property will not be damaged and that it will be vacated on ten days' notice if necessary. For social reasons and economic purposes we endeavor to group the gardens, for instance, we have one piece of land 13 acres in extent, which is sub-divided into 65 gardens. The land is manured, ploughed, and harrowed, with a numbered signboard on each lot, and we also supply seeds. The applicants pay $1.00 for all the privileges for the season and agree to be governed by rules of cultivation and care of the allotment, and an identification card is handed to each lot holder with his or her name and address. The City supplies water free. The local papers render great assistance in giving the work publicity, which is a big factor in securing land and applicants. The superintendent supervises the plowing, cultivating, and organizing, addresses meetings, and delivers lectures on gardening in all parts of the city. From the reports that have to be sent in at the end of the season is found something of the battles of life of the lot holders and their work against all kinds of difficulties, and their appreciation of opportunity has been truly wonderful. In 1916 forty-seven returned soldiers and wives of soldiers overseas took advantage of the opportunities offered by the Association, and the brave fight of some of the crippled ones to wrest a living from the soil was a sight to stir both the sympathy and the wholesome ambition of the onlooker. It is expected that upwards of a hundred returned soldiers will be with us this year. The movement is beneficial from a reactionary point of view—it encourages thrift, it stimulates confidence and honesty by exposing personal property on public thoroughfares, it is usually a direct cause of beautifying yards, roads and lanes in the neighborhood of the gardens. The Association is purely philanthropic and is kept up by voluntary contributions.

The following garden plan suitable for an ordinary vacant lot, together with details of cultivation and best varieties to grow, is recommended by the Association for the guidance of its lot holders:

The plan shows thirty-six rows of potatoes in six varieties to be governed by the varieties that can be obtained locally. In preparing the seed a large sized tuber should be cut into four pieces, medium size to three, and smaller size to two pieces. Plant tubers 5 inches deep in sandy loam, 4 inches in clay soils, 10 inches apart in the rows which should be 30 inches apart, so as to give sufficient room for cultivating in between, which should be done four times at least and six times will improve the crop. Plant May 1st to 15th according to weather conditions, the first earthing up to be done when the haulms are 6 inches high; spray with Paris green and Bordeaux mixture for potato bug and blight, first spraying as soon as foliage appears above ground and as often as necessary to keep ahead of the bug. Do not neglect the spraying as it will not only be the means of your losing your own crop but endangers your neighbour's. Try to arrange to dig the potatoes after three days of fine dry weather, put in sacks and keep in a cool, dry place in the cellar for winter.

Swede Turnips.—Purple Top is the best variety for culinary purposes; sow seeds May 24th 1 inch deep, rows 18 inches apart, and when plants are up 3 inches thin them out to 10 inches apart at least as the foliage requires lots of room to enable it to develop the roots. Pull crop first week in October and treat same as potatoes for winter use.

Carrots.—One row of each, Early Nantes and Oxheart; sow seeds May 24th ½ inch deep in rows 18 inches apart, thin to 6 inches, do not allow the tops of the

roots of carrots and beets to be exposed, which causes sunburn; cultivate freely between rows of all root crops.

Beets.—Three varieties, Flat Egyptian, Cardinal Globe, and Long Blood Red; sow and thin as for carrots.

Cabbage.—Unless you raise your own plants you have to take what you can get from the corner grocery, or place your order for certain varieties of plants with the seedsmen. Henderson's Summer Early Cabbage is the best for either early, mid-season, or late, their flavor is of the best. The plants should be planted in the rows 18 inches apart, watch carefully for green caterpillar, and either hand pick or use slug shot, cultivate freely and often in between.

Parsnips.—Hollow Crown, sow seeds same as for carrots, thin to 6 inches. If bothered with a maggot in the crown, use white hellebore, or slaked lime.

Beans.—Wardwell's Kidney Wax is recommended; to have a succession, do not plant too many at a time, but sow a row every two weeks from June 1st to end of July or 1st week in August; do not cultivate betweeen rows when foliage or soil is damp, as this brings on "Anthracnose."

Onions.—Southport, Red White, and Yellow Globe are the best for shape, size and flavor, the soil must be very rich if you want exhibition-sized onions; sow seeds April 1st in flats or in hotbed, having plants 8 inches long ready to transplant May 24th. By using this method you get ahead of the onion maggot, as the plant of that size is too strong for the maggot to do serious damage. Plant 4 to 6 inches apart, and cultivate frequently; they like lots of moisture. Pull and leave on top of the ground in dry weather to dry out before putting in cellar.

Tomatoes.—Chalk's Early Jewel is strongly recommended, if they can be obtained, if not, raising your own plants, do not set out till June 1st, as they are very susceptible to damage by frost. Train strongest shoots up four stakes 4 feet 6 inches above ground, removing all other laterals and suckers as fast as they appear; do not cultivate deeply as rootlets have a tendency to come close to the surface for moisture, so use a rake for cultivating rather than a hoe; do not water on foliage at any time. Look out for a long green caterpillar, thick as a pencil, which will do a lot of damage in one night, catch it before it does its work. Plants should be 3 feet 6 inches to 4 feet apart each way.

Corn.—Golden Bantam for early and Country Gentleman for late; plant in rows 4 feet apart and earth up same as for potatoes. As a protection from wind put seeds in here and there of Long Green cucumber, also a few Green Hubbard squash and let them run in about the corn. Sprinkle a few radish and lettuce seeds in between the rows of potatoes every week for succession.

For protection against the ravages of the Cutworm, which is very prevalent in the spring, get about four pounds slaked lime, two pounds powdered sulphur, one tablespoonful of Paris green, mix thoroughly together, dry, and scatter broadcast all over the garden. Do this before sowing seeds and rake in. Use a line rather than your eye for straightness of rows, and finally be "thorough" in all your operations.

The Convention then closed with the singing of the National Anthem.

ACTUAL RECEIPTS AND EXPENDITURE OF HORTICULTURAL SOCIETIES IN 1916.

Societies.	Members' fees.	Legislative grant.	Municipal grants and donations.	Gate receipts at exhibitions.	Total actual receipts.	For exhibitions.	For seeds, bulbs and plants and Civic Improvement.	Lectures and periodicals.	Officers' salaries.	Total actual expenditure.
Amherstburg	$68	$108	$60	.....	$282	.....	$268	.....	$15	$305
Aylmer	131	75	.....	.....	327	.....	188	.....	.....	263
Barrie	214	188	.....	.....	414	.....	372	$6	35	470
Belleville	82	93	50	.....	230	.....	129	7	25	219
Bowmanville	90	62	.....	.....	152	.....	124	.....	10	146
Brampton	249	156	150	.....	555	.....	400	124	.....	555
Brantford	521	216	100	.....	837	*$187	557	34	100	927
Cardinal	59	40	.....	.....	111	.....	108	.....	.....	109
Carleton Place	229	122	30	.....	406	*16	372	8	.....	462
Cayuga	50	64	106	.....	249	.....	150	.....	.....	200
Chatham	430	125	1,000	.....	1,768	.....	376	11	.....	1,681
Chesterville	61	38	.....	.....	105	.....	70	.....	15	113
Clifford	112	176	.....	$229	736	335	100	.....	30	765
Clinton	200	135	25	.....	360	.....	316	.....	.....	335
Cobourg	72	61	.....	.....	133	.....	82	34	2	124
Dryden	34	77	25	12	160	62	*18	.....	25	147
Dundalk	56	48	.....	.....	106	.....	59	.....	.....	90
Dundas	107	92	.....	.....	433	16	351	22	25	448
Durham	43	57	16	.....	148	.....	71	2	30	148
Elmira	70	67	32	13	190	46	61	21	10	167
Elora and Salem	86	75	.....	10	191	72	54	.....	12	178
Essex	170	64	25	.....	269	.....	198	2	5	241
Fergus	65	57	.....	10	135	68	25	.....	15	142
Ford City	83	75	.....	.....	158	.....	76	.....	.....	120
Fort William	99	91	15	.....	229	98	64	2	.....	194
Galt	255	214	112	24	626	222	*72	129	87	100	676
Goderich	144	104	45	.....	293	.....	255	.....	20	295
Grimsby	72	43	.....	.....	115	.....	97	41	.....	148
Guelph	227	188	100	.....	527	.....	254	135	.....	508
Haileybury	79	107	83	28	336	133	5	7	35	314
Hamilton	526	329	50	.....	966	14	382	34	100	1,048
Hanover	185	102	45	8	382	.....	294	20	20	420
Hespeler	91	76	.....	.....	171	.....	102	45	10	170
High Park	142	78	5	.....	244	114	*20	60	.....	258
Hillsburg	60	75	15	85	312	178	18	.....	7	300
Kingston	88	176	.....	.....	264	.....	.....	.....	50	162
Kingsville	106	89	25	72	292	.....	271	.....	.....	320
Kitchener	256	320	386	89	1,145	335	303	62	100	1,105
Lindsay	147	65	.....	.....	212	.....	147	74	25	255
Listowel	87	75	150	.....	405	.....	225	5	.....	265
London	556	288	.....	.....	871	.....	403	457	120	1,040
Markdale	†	.....	.....	.....	.....	.....	.....	.....	.....	.....
Midland	80	61	.....	.....	149	.....	127	3	5	145
Milton	81	71	.....	16	174	37	85	.....	.....	142
Mitchell	116	79	.....	.....	219	.....	146	58	25	244
Napanee	70	60	80	.....	217	.....	162	.....	25	197
Newcastle	69	58	.....	.....	127	.....	89	.....	.....	107
Oakville	76	70	.....	.....	146	.....	81	3	.....	92
Orangeville	113	138	.....	.....	488	.....	374	.....	10	427
Orillia	124	75	.....	.....	199	.....	107	8	.....	144
Oshawa	169	106	.....	.....	281	206	.....	.....	10	230
Ottawa	901	470	205	.....	1,611	139	*173	897	10	150	1,599
Owen Sound	119	121	55	27	404	130	142	4	15	385
Paris	204	145	125	.....	707	18	*82	492	16	.....	682
Perth	†	.....	.....	.....	.....	.....	.....	.....	.....	.....
Peterborough	364	251	102	.....	732	12	491	69	50	728
Picton	64	52	.....	.....	116	.....	61	16	20	114
Port Credit	60	57	10	.....	128	14	11	4	.....	85

* For lawns and gardens. †No returns.

ACTUAL RECEIPTS AND EXPENDITURE OF HORTICULTURAL SOCIETIES IN 1916.—Continued.

Societies.	Members' fees.	Legislative grant.	Municipal grants and donations.	Gate receipts at exhibitions.	Total actual receipts.	For exhibitions.	For seeds, bulbs and plants and Civic Improvement.	Lectures and periodicals.	Officers' salaries.	Total actual expenditure.
Port Dover	$87	$121	.....	.....	$281	.....	$110	$50	$40	$213
Port Hope	126	88	.....	.....	214	.....	169	27	10	215
Richmond Hill	87	65	$43	.....	195	$64	.....	85	.....	201
St. Catharines	753	677	484	$283	2,387	538	756 *107	18	260	2,670
St. Thomas	1,214	800	965	.....	4,756	50	3,546	73	364	4,463
Sandwich	256	344	662	.....	1,408	55	550	.....	.....	1,359
Seaforth	110	108	25	.....	600	.....	480	15	25	590
Smith's Falls	89	153	200	6	453	41	301	1	.....	424
Sterling	72	57	.....	12	143	5	146	.....	.....	151
Stratford	600	349	63	.....	1,074	44	635	6	60	1,006
Strathroy	300	130	.....	.....	430	.....	295	34	25	389
Streetsville	50	64	5	.....	119	.....	85	26	.....	118
Thornhill	67	67	13	.....	263	.....	.....	.....	.....	172
Tillsonburg	141	136	2	7	465	26	283	4	25	420
Toronto	827	500	503	.....	2,170	.....	†155	37	150	3,562
Walkerton	68	54	.....	25	160	22	34	36	22	136
Walkerville	328	287	.....	.....	630	10	326	.....	75	538
Waterloo	85	98	35	.....	218	.....	80	13	40	213
Westboro	79	50	.....	.....	134	39	89	.....	15	173
Weston	169	119	19	.....	372	102	165	.....	10	376
Whitby	106	85	.....	.....	220	.....	133	48	.....	199
Winchester	153	106	125	.....	447	11	257	2	20	435
Windsor	801	614	500	.....	2,223	.....	1,622	19	75	2,033
Woodstock	98	89	83	13	286	25	172 *27	.....	35	398
Totals	15,678	11,528	6,954	969	41,191	3,484	21,571	1,984	2,502	41,608

* For lawns and gardens. †School gardens.

STATEMENT OF MEMBERSHIP AND LEGISLATIVE GRANTS FOR 1915-17.

Societies.	Expenditure in 1915, on which grant for 1916 is based.	Membership.		Legislative grants.		
		1915	1916	1915	1916	1917
Amherstburg	$379 60	90	68	$121	$108	$76
Aylmer (organized in 1916)	.....	.....	131	.....	75	82
Barrie	637 17	175	280	234	188	160
Belleville	292 84	103	82	95	93	62
Bowmanville	162 90	95	90	66	62	49
Brampton	426 58	223	249	174	156	169
Brantford	669 05	249	521	266	216	309
Cardinal	113 30	52	59	49	40	35
Carleton Place	317 76	188	229	90	122	146
Cayuga	230 90	50	50	54	64	51
Chatham	302 25	208	430	75	125	438
Chesterville	102 60	56	61	37	38	35
Clifford	615 85	151	112	190	176	179
Clinton	375 20	190	200	133	135	114
Cobourg	167 98	83	72	71	61	40
Dryden	280 56	55	50	54	77	40
Dundalk	138 94	63	56	50	48	30
Dundas	285 98	106	107	75	92	113
Durham	189 28	56	57	74	57	42
Elmira	198 86	86	70	110	67	48
Elora & Salem (organized in 1916)	.....	.....	86	.....	75	54
Essex	146 58	114	170	75	64	87

STATEMENT OF MEMBERSHIP AND LEGISLATIVE GRANTS FOR 1915-17.—Concluded.

Societies.	Expenditure in 1915, on which grant for 1916 is based	Membership.		Legislative grants.		
		1915	1916	1915	1916	1917
Fergus	$171 78	70	65	$52	$57	$42
Ford City (organized in 1916)	.....	.....	83	.....	75	43
Fort William	255 99	123	99	101	91	61
Galt	696 80	221	255	233	214	195
Goderich	314 75	139	144	97	104	92
Grimsby	106 17	69	72	68	43	45
Guelph	648 51	166	244	215	188	158
Haileybury	371 29	91	111	106	107	88
Hamilton	919 72	457	526	474	329	334
Hanover	285 41	141	185	116	102	127
Hespeler	240 52	85	91	64	76	55
High Park	196 36	125	144	90	78	84
Hillsburg (organized in 1916)	.....	.....	76	.....	75	77
Kingston	562 95	190	88	77	176	52
Kingsville	285 60	97	106	109	89	88
Kitchener	1,126 54	266	318	363	320	297
Lindsay	200 22	75	147	57	65	85
Listowel (organized in 1916)	.....	.....	87	.....	75	73
London	800 86	400	556	383	288	340
Markdale	164 89	60	.....	66	53	.....
Midland	178 24	78	80	82	61	47
Millbrook	118 90	69	.....	52	46	.....
Milton	190 65	105	81	75	71	46
Mitchell	216 96	112	116	85	79	75
Napanee	196 72	60	70	51	60	54
Newcastle	163 70	78	69	60	58	36
Oakville	185 44	105	76	83	70	35
Orangeville	468 48	127	113	143	138	111
Orillia (organized in 1916)	.....	.....	124	.....	75	57
Oshawa	254 70	180	169	106	106	84
Ottawa	1,364 10	614	901	470	470	535
Owen Sound	371 58	140	145	145	121	110
Paris	492 90	133	226	138	145	189
Perth	545 38	186	.....	178	171	.....
Peterborough	689 67	360	376	228	251	234
Picton	144 12	74	64	68	52	37
Port Credit	158 79	78	59	75	57	32
Port Dover	443 95	87	87	135	121	62
Port Hope	226 18	136	126	103	88	72
Richmond Hill	189 27	85	87	75	65	60
St. Catharines	2,112 86	772	753	800	677	713
St. Thomas	4,164 13	1,370	1,188	800	800	800
Sandwich	1,308 00	213	256	167	344	292
Sault Ste. Marie	139 32	90	.....	67	56	.....
Seaforth	383 49	87	110	106	108	143
Smith's Falls	573 42	103	89	162	153	101
Stirling	174 68	67	72	62	57	46
Stratford	949 90	501	600	343	349	344
Strathroy	324 09	211	300	113	130	149
Streetsville	168 15	96	50	69	64	34
Thornhill (organized in 1916)	.....	.....	67	.....	67	49
Tillsonburg	438 53	143	141	102	136	116
Toronto	2,455 93	1,179	900	500	500	593
Walkerton	242 37	75	70	67	54	42
Walkerville	848 26	362	328	250	287	184
Waterloo	306 13	111	85	140	98	61
Westboro	109 00	92	76	61	50	51
Weston	340 36	158	191	108	119	120
Whitby	248 39	109	106	60	85	64
Winchester	342 35	112	165	127	106	125
Windsor	2,131 49	537	751	549	614	585
Woodstock	276 58	102	98	74	89	101
Totals	38,019 70	14,565	15,992	11,833	11,992	11,284

PRESIDENTS AND SECRETARIES OF HORTICULTURAL SOCIETIES.

Societies.	Presidents.	Secretaries.	Address.
Alvinston	H. R. Sharp	J. E. V. Atkins	Alvinston.
Amherstburg	O. Tester, M.D.	Rev. F. O. Nichol	Amherstburg.
Aylmer	F. L. Wagner	H. D. Hicks	Aylmer.
Barrie	Walter N. Duff	T. T. Young	Barrie.
Belleville	H. Wedden	W. J. Diamond	Belleville.
Blenheim & Harwich	Dr. C. B. Langford	O. F. Anderson	Blenheim.
Bowmanville	Richard Jarvis	Mrs. E. V. Scobell	Bowmanville.
Brampton	T. Thauburn	F. T. Jennings	Brampton.
Brantford	E. E. C. Kilmer	H. S. Tapscott	Brantford.
Brussels	W. H. Kerr	B. S. Scott	Brussels.
Cardinal	J. F. Carr	J. F. Harries	Cardinal.
Carleton Place	A. H. Edwards	J. R. McDiarmid	Carleton Place.
Cayuga	Rev. A. W. H. Francis	G. E. Hudson	Cayuga.
Chatham	Jno. Glassford	Rev. J. J. Haylock	Chatham.
Chesterville	Mrs. C. W. Casselman	A. E. Bolster	Chesterville.
Clifford	David Campbell	Jno. R. Scott	Clifford.
Clinton	M. D. McTaggart	Thos. Cottle	Clinton.
Cobourg	G. J. Anderson	C. R. Gummer	Cobourg.
Dryden	Dr. H. G. Dingwall	Alex. Kennedy	Dryden.
Dundalk	F. Martin	M. W. Ridley	Dundalk.
Dundas	F. E. Lennard	Jas. A. Kyle	Dundas.
Durham	Jno. McGowan	Cliffe Elvidge	Durham.
Elmira	C. T. Ruppel	C. W. Schierholtz	Elmira.
Elora & Salem	Wm. McPhee	W. D. Mendell	Elora.
Essex	A. W. Massey	Rev. H. Miller	Essex.
Fergus	Jno. Malcolm	J. C. Templin	Fergus.
Ford City	Jos. L. Reaume	Ulysses G. Reaume	Ford City.
Fort William	Paul Vanderkaa	Mrs. H. M. Piper	Fort William.
Galt	L. Norman	E. R. Scott	Galt.
Goderich	Jno. Stratton	W. Lane	Goderich.
Grimsby	E. G. McCallum	W. B. Calder	Grimsby.
Guelph	J. E. Carter	H. S. Fry, O.A.C.	Guelph.
Haileybury	P. H. Wayman	J. N. White	Haileybury.
Hamilton	Jno. A. Webber	Mrs. R. B. Potts	16 Bruce St., Hamilton.
Hanover	D. Luesing	Miss F. Kirchner	Hanover.
Hespeler	Theo. Buck	E. H. Bilkin	Hespeler.
High Park	W. T. Graham	H. P. Howard	208 Pearson Ave., Toronto.
Hillsburg	Miss E. McKinnon	Miss Edna McKinnon	Hillsburg, R.R. 1.
Ingersoll	Rev. J. G. Scott	Mrs. F. W. Bowman	Ingersoll.
Kingston	Lt-Col. R. E. Kent	A. W. McLean	Kingston.
Kingsville	W. E. DeLong	J. E. Brown	Kingsville.
Kitchener	H. R. Wood	Wm. Downing	Kitchener.
Lindsay	G. H. M. Baker	J. A. Trask	Lindsay.
Listowel	J. M. Campbell	Thos. Male	Listowel.
London	W. E. S. Potts	A. M. Hunt	London.
Markdale	(No returns)		
Midland	A. W. Bell	Miss B. Anderson	Midland.
Milton	Mrs. M. E. Gowland	Miss Mary Scott	Milton.
Mitchell	Rev. A. Dede	A. J. Blowes	Mitchell.
Napanee	E. J. Pollard	W. S. Herrington	Napanee.
Newcastle	Rev. J. W. Rae	Mrs. J. E. Matchett	Newcastle.
Oakville	W. S. Savage	L. V. Cote	Oakville.
Orangeville	T. H. Henderson	H. F. Tuck	Orangeville.
Orillia	Dr. A. P. Ardagh	J. Day	Orillia.
Oshawa	D. A. Valleau	Mrs. E. J. Jacobi	Oshawa.
Ottawa	F. E. Buck	H. W. Jackson	195 Waller St., Ottawa.
Owen Sound	Arthur Burt	Miss J. S. Maughan	
Palmerston	(No returns)		
Paris	W. N. Bell	C. R. Whitby	Paris.
Perth	(No returns)		

PRESIDENTS AND SECRETARIES OF HORTICULTURAL SOCIETIES.—Continued.

Societies.	Presidents.	Secretaries.	Address.
Peterborough	W. Stocker	C. H. Williamson	Peterborough.
Picton	J. L. Graydon	Walter T. Ross	Picton.
Port Credit	A. W. Briggs	W. H. Arms	Port Credit.
Port Dover	Jno. Aldredge	Jno. Aldredge	Port Dover.
Port Hope	A. H. R. Watson	W. T. Greenaway	Port Hope.
Richmond Hill	L. E. Hand	Rev. A. Herbison	Richmond Hill.
St. Catharines	W. B. Burgoyne	Mrs. Pirie Blain	St. Catharines.
St. Thomas	Dr. F. E. Bennett	R. W. Johnson	St. Thomas.
Sandwich	Dr. W. J. Beasley	A. R. Marentette	Sandwich.
Seaforth	Wm. Hartry	A. D. Sutherland	Seaforth.
Smith's Falls	W. T. Ferguson	H. S. Hunter	Smith's Falls.
Stirling	J. S. Morton	G. Kennedy	Stirling.
Stratford	H. W. Strudley	S. A. McConkey	Stratford.
Strathroy	F. W. Atkinson	F. P. Hughes	Strathroy.
Streetsville	S. H. Smith	Jno. Keir	Streetsville.
Thornhill	A. W. Galbraith	Miss M. Simpson	Thornhill.
Tillsonburg	V. A. Sinclair	H. Fairs	Tillsonburg.
Toronto	P. H. Mitchell	C. St. George Freer	59 Chelsea Ave., Toronto.
Walkerton	M. G. Dippel	Jas. Tolton	Walkerton.
Walkerville	C. D. Brown	D. C. Bawtinheimer	Walkerville.
Wallaceburg	Rev. A. Calder	Mrs. A. D. Brander	Wallaceburg.
Waterloo	Robt. Sims	J. Uffelmann	Waterloo.
Westboro	T. B. Cole	Miss B. Davidson	Woodroffe.
Weston	Jno. Dickin	J. M. Pearen	Weston.
Whitby	Rev. J. Fletcher	R. M. Tipper	Whitby.
Winchester	J. H. Ross	E. N. Elliott	Winchester.
Windsor	Mrs. C. W. Cadwell	H. J. McKay	Windsor.
Woodstock	J. Y. Smiley	W. L. Mackay	Woodstock.

FORTY-EIGHTH ANNUAL REPORT

OF THE

Fruit Growers' Association

OF

Ontario

1916

(PUBLISHED BY THE ONTARIO DEPARTMENT OF AGRICULTURE)

PRINTED BY ORDER OF

THE LEGISLATIVE ASSEMBLY OF ONTARIO

TORONTO:

Printed by A. T. WILGRESS, Printer to the King's Most Excellent Majesty

1917

Printed by
WILLIAM BRIGGS
Corner Queen and John Streets
TORONTO

To His Honour SIR JOHN STRATHEARN HENDRIE, C.V.O., a Lieutenant-Colonel in the Militia of Canada, etc., etc., etc.

Lieutenant-Governor of the Province of Ontario.

MAY IT PLEASE YOUR HONOUR:

I have the honour to present herewith for your consideration the Forty-eighth Report of the Fruit Growers' Association of Ontario for the year 1916.

Respectfully yours,

W. H. HEARST,

Minister of Agriculture.

Toronto, 1917.

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Fruit Growers' Association of Ontario

OFFICERS FOR 1917

President..... F. A. J. Sheppard, St. Catharines.
Vice-President.....R. W. Grierson, Oshawa.
Secretary-Treasurer..... P. W. Hodgetts, Parliament Buildings, Toronto.
Executive..... Officers, together with W. F. W. Fisher, Burlington; Thos. Rowley, Leamington.
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Auditor.....D. Cashman.

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2. E. Casselman, Iroquois.
3. Howard Leavens, Bloomfield.
4. J. G. Wait, Colborne.
5. R. W. Grierson, Oshawa.
6. W. F. W. Fisher, Burlington.
7. J. R. Hastings, Winona.

Div. 8. F. A. J. Sheppard, St. Catharines.
9. Chas. Howard, Hagersville.
10. Thos. Rowley, Leamington.
11. A. Stephenson, Longwood.
12. J. C. Harris, Ingersoll.
13. W. Mitchell, Clarksburg.

Ontario Agricultural College: Prof. J. W. Crow.

Vineland Experiment Station: E. F. Palmer.

Representatives to Fair Boards and Conventions.

Canadian National: W. F. W. Fisher, Burlington.
London: Albert Stephenson, Longwood, and Thos. Rowley, Leamington.
Ottawa: Messrs. F. A. J. Sheppard and D. Johnson.

Committees.

Horticultural Publishing Company: P. W. Hodgetts, Toronto.

New Fruits: W. T. Macoun, Ottawa; Prof. J. W. Crow, Guelph; E. F. Palmer, Vineland Station.

Historical: A. W. Peart, Burlington; W. T. Macoun, Ottawa.

TREASURERS' REPORT, 1916

Receipts.		Expenditures.	
Balance on hand, Dec. 31, 1915.	$307 59	Annual Meeting	$206 00
Fees	246 50	Committees	14 85
Grant	1,700 00	Periodicals	299 15
Miscellaneous	42 24	Printing	9 50
		Transportation	1,254 97
		Miscellaneous	30 99
		Balance on hand	480 87
	$2,296 33		$2,296 33

DETAILS OF EXPENDITURES.

Annual Meeting.

G. H. Webster (Canadian Passenger Agent), deposit	$25 15
H. A. Emerson	45 25
S. O. Blunden	6 30
John Kirkpatrick	7 00
M. A. P. McFarlane	6 45
Fred Carpenter	5 30
J. R. Hastings	2 55
J. G. Wait	3 60
R. A. Stephenson	5 60
Alex. Jamieson	12 65
W. E. Palmer	12 15
F. G. H. Pattison	80
Jno. F. Donald	6 80
P. Hynd	6 40
M. E. Coo	60 00
Total	$206 00

Committees.

A. W. Peart	$3 15
A. J. Grant	11 70
Total	$14 85

Periodicals.

Canadian Horticulturist	$299 15

Printing.

College Press, letterheads and envelopes (Directors)	$9 50

Transportation.

G. E. McIntosh	$1,228 67
A. J. Grant	26 30
Total	$1,254 97

Miscellaneous.

Canadian Express Co.	$0 60
Exchange	1 89
P. W. Hodgetts, expenses	8 50
Auditor	10 00
Insurance	10 00
Total	$30 99

Audited this 7th day of February, 1917, and found correct.
D. F. Cashman, *Auditor.*

A. J. Grant, *President.*
P. W. Hodgetts, *Secretary-Treasurer.*

The Fruit Growers' Association of Ontario

ANNUAL MEETING

The fifty-seventh annual meeting of the Fruit Growers' Association of Ontario was held in the Parliament Buildings, Toronto, February 8th and 9th, 1917.

The President, Dr. A. J. Grant, Thedford, occupied the chair throughout the Convention, and the meetings were all very largely attended.

PRESIDENT'S ADDRESS.

Dr. A. J. Grant, Thedford.

As President of the Ontario Fruit Growers' Association, it affords me a great deal of pleasure to welcome you to this our fifty-seventh Annual Convention. Any organization which can boast of having passed the half century mark with a consistent record of successful Annual Conventions must surely have established its worth, and I am satisfied you will all agree with me that the Fruit Growers' Association of Ontario has established its worth in large measure, and that the efforts of our older members, many of them passed and gone, cannot be too highly commended for having laid such a true and firm foundation.

We should deem it a wonderful privilege to be enabled to meet as usual in this fair city of Toronto when our great Empire is one of the principals in the most titanic struggle that the world has ever known and it is indeed most fitting that we should discuss our problems at this time since greater responsibility rests upon our shoulders in keeping business at home in the most prosperous possible condition so that we may be the better enabled to contribute our share of the great financial burdens thrust upon us as a partner in the British Empire. Canada has done nobly in the great war and the spirit of our people is one of grim determination to see things through, regardless of the cost until our efforts in the interests of right and justice shall have been crowned by a righteous and abiding peace.

It is quite unnecessary for me to dilate upon the many advantages enjoyed by the fruit industry in general which were achieved as a direct result of the activities of this Association. It is most vital to our interests as fruit growers that these activities shall continue, and if we expect to speak as one with authority, expecting to be heard, then we must see to it that our organization is numerically strong and that it is really representative of the fruit industry of Ontario. Many of our local associations handle apples only, and owing to the experiences of the past three seasons, many of them are dormant and some have passed out of existence entirely. This has caused a decrease in the membership of our Provincial organization which has reached rather serious proportions during the past year. A good apple crop would rejuvenate many of these local associations and bring them back to the fold, but the fact remains that there exists a great field for work among these erstwhile associations. Many of them met their first discouragements as far back as the season of 1914. There was a bountiful crop of apples of good quality, but the outbreak of the war, on the eve of harvest created

such a condition of panic in the apple business that thousands of barrels were never picked and many associations received their "Baptism of Fire" in business reverses; something entirely new to the older organizations and quite sufficient to cause discouragement. Then followed the two lean seasons of 1915 and 1916 with their short crops and poor quality. I know of several associations which have not shipped any apples during these two seasons and some of them will have to be entirely reorganized. Every association should be an incorporated body, either with or without share capital, enjoying a permanent membership. New members should only be admitted by a majority or a two-thirds vote. Under such conditions members learn to appreciate the organization and will pay their annual dues even if a blank year, from a shipping standpoint, is experienced. A member wishing to withdraw should be required to give notice in writing before a certain date. I would like to see the Co-operation and Markets Branch undertake to get these associations on their feet, and then let our Provincial Association undertake an aggressive campaign for membership so that we may enjoy the affiliation of every active association in Ontario.

It was considered advisable at the last annual convention to increase the membership fees from twenty-five cents to the mighty sum of fifty cents per annum. The reasons for the increase were well threshed out at the time, the chief one being that under the old order of things we were really losing twenty cents on each member enrolled, in the fact that for an annual fee of twenty-five cents, we gave him our official paper, *The Canadian Horticulturist,* at a cost of fifty cents. The new fee simply covers the cost of putting this publication in the hands of our members, leaving us dependent upon the Government grants for carrying on our transportation and other activities. It has been suggested that the increased fee has caused some of our associations to withdraw their affiliation, but I am sure you will agree with me that to entertain this opinion would be putting our fellow growers into a very niggardly class. On the other hand, if the additional twenty-five cents has really deterred anybody from affiliation it is simply another strong reason why we should get busy upon a membership campaign in order to show the growers that our institution means something of benefit to them. The transportation work which this Association has been doing during the past few years has put thousands of dollars into the pockets of the fruit growers of this Province. We all profit by this work, both in the Association and out of it, and there are hundreds of individual fruit growers throughout the Province of Ontario who would be glad of an opportunity to show their appreciation of this work by becoming members of our Association. It is our business to get into touch with them.

Financially, we have had a very successful year, closing with a balance on hand amounting to some $480. Our big item of expenditure has been the work of the transportation department, and Mr. McIntosh will give you a detailed statement of his work in this connection. That a transportation expert is necessary is well borne out by the fact that most of the successful business associations in the world find it profitable to have men in their employ whose sole business it is to look after the placing of their goods in the hands of the trade. If manufacturers and kindred interests find it profitable as well as necessary how much more so should it be to us as producers of the most perishable of all commodities. In fact, we are absolutely dependent upon transportation. You may deliver to the carrier a shipment of fruit in perfect condition but the condition at the other end of the route is the one of most vital importance. Profitable

growing of certain varieties of fruits depends absolutely upon proper train service to certain markets. Transportation companies are willing to reciprocate in every reasonable way, but they handle coal as well as fruit, and it is our duty to have a specialist constantly on the alert who understands the vital necessities of proper fruit shipment. And, after all, "The proof of the pudding is in the eating," and the work of our transportation expert has proved to us abundantly that it does pay to have him on the job.

We in Ontario are not only interested in local markets but we are equally interested in the markets of the Canadian North-West and the various export markets. Our work in this regard should cover all these fields, but we are only a Provincial Association, and to do this would be far beyond our means. Would it not be a reasonable request to ask the Minister of Agriculture at Ottawa to appoint a transportation expert in connection with the Department of the Dominion Fruit Commissioner? I am not so sure that we could then afford to abandon our local work, but this would be a broad step in the interests of every fruit grower throughout the Dominion of Canada. I claim no originality for this idea but I might say that I have already been in touch with the British Columbia Fruit Growers' Association, through their President, Mr. Thos. Abriel, and he is heartily in accord with such a move, while we have every reason to believe that our Eastern Growers would see the advantage as readily as we do. A strong resolution from this convention would undoubtedly do much toward seeing its realization.

The season just closed has been a very profitable one for the grower who had the fruit. Business conditions throughout Canada have been exceptionally good with abundance of money in circulation. Some of the prices being paid for good apples should be a great stimulus for us to produce more really good fruit. There never was and never will be any money in producing low grade fruit, and we are only wasting valuable time when we discuss methods of marketing it. Put the high class fruit on the market and send the rest of it to the evaporators and canning factories, or feed it to the hogs. You will frequently read "high-brow" articles in the press about the many poor people in the cities who would be glad to get this low grade fruit. No doubt there is a certain measure of truth in these statements, but they should be discussed in connection with philanthropic movements and not in connection with the business end of fruit growing. That there is a growing demand for more good apples than we are producing is a well recognized fact among progressive growers. The same may be said of many other fruits. Undoubtedly, more care in the grading and packing of tender fruits would make this line more remunerative. Some of our new districts require a lot of education in the putting up of tender fruits, and until they become educated their product will certainly spoil the market to a certain extent. This is not meant to belittle the efforts of new districts, for I class my own district as new in the matter of tender fruits; but there is a lot more to learn in the putting up of a tasty package of tender fruit than many of us are ready to admit. The same line of reasoning might be applied to small fruits. Large quantities of berries are imported annually during our own market season, and only too often our Ontario grown fruit will not open up as tastily as the imported fruit which has come many times the distance. I am not in a critical mood nor am I assuming the role of a pessimist; on the other hand I am an optimist of the first order, but the fact remains that we Ontario fruit growers are not producing high class fruit in sufficient quantity to satisfy the demand. We must cater to a public which

is becoming more discriminating all the time for the standards of living have advanced in the matter of fruit as well as in other commodities. I saw apples being sold in London, Ontario, one month ago at thirty cents per dozen. Were they Ontario apples? No, they were from the Western United States, and people even in this comparatively small city bought them freely and seemed to enjoy the novelty of buying these beautiful looking apples as they had been in the habit of buying oranges. Why not get after some of this trade with our Spies, Kings, Snows, McIntosh, Wagener and other good red varieties? Ontario apples carried off the honors at Rochester, N.Y., this year, in the box class open to all comers and this is not the first time that such a thing has happened. You must get color and finish on your apples to supply this trade, and I am fully convinced that at least certain sections of Ontario can produce the necessary color and finish. We have frequently wondered why people prefer oranges and bananas for dessert instead of apples. Simply because we are not putting up an apple sufficiently attractive in appearance to fill the bill.

We have all been pained to see the retrogression of the average farm apple orchard. Thousands of trees of our very finest winter varieties in blocks of three to ten acres attached to the 100-acre farm are being allowed to grow wild because the day has arrived when the trade demands fruit of quality and to produce this requires special knowledge of spraying, etc., which the farmer only too often does not possess, and being interested in other branches of farming, has no inclination to learn. Many farmers work their apple orchard as one of the branches of the farm, and are making a splendid success of it. In fact, some of the very finest apple orchards in the Province fall into this class. But what of the orchard that is being neglected, and is sometimes producing low grade fruit, which only too often gets packed and hurts our market? There are great opportunities for progressive men in the various apple districts to lease these orchards for a term of years, thereby yielding the owner a much greater financial return in the manner of rent and at the same time rewarding the lessee handsomely for his labors. I am not advocating a gigantic scheme of leased orchards such as some of those which have already operated in this Province, but it is possible in nearly every place to find a few men who are taking care of their orchards, and who are equipped with the necessary machinery for the work. Let us endeavor to show these men that good profits can be made by leasing an orchard or two in their own neighborhood, and thus turn the low grade product of these orchards into high grade fruit which will assist our market rather than damage it. A great deal could be done in this respect if the representatives from our Provincial Fruit Branch were supplied with practical data covering the matter, and such could readily be obtained from practical growers, for the idea of leasing orchards is not new by any means. These men come across orchards such as I refer to almost daily, and are usually well enough acquainted in the neighborhood to know the men who might take hold and make a success of them. That the scheme is practical I know from a limited personal experience and a wide application of it would assist in bracing up many a local association by placing the good orchards in the hands of men well equipped and trained for orchard work.

I would like to remind our good friend, the Dominion Fruit Commissioner, that we are anxiously awaiting the proposed improvement in the Fruit Marks Act relative to the grading of apples. We must have our number two grade more explicitly defined, and we must have a third grade with the standard specified and subject to inspection. The latter would include well matured apples affected with

scab but being subject to inspection should give the consumer a run for his money. Some of the No. 3 apples packed this last season were a disgrace to all concerned in the deal and I think most of us would welcome the advent of a law making it impossible to market such trash in a closed package.

In closing permit me to thank you for your assistance and co-operation throughout the year. Fruit growers in Ontario have a glorious heritage. Providence has blessed us with the best possible conditions for the production of high class fruits. Let us make the most of these opportunities, and strive hard to reach such a standard of excellence in our products that they will win their way into the markets of the uttermost parts of the earth.

VARIETIES OF APPLES FOR PLANTING.

H. T. Foster, Burlington.

What I have to say will refer solely to my own district, as I understand there are three or four speakers to address you on this subject, and they will take up the other parts of the Province.

In speaking to the question of varieties to plant, my remarks will have to do with planting for commercial purposes, as that differs somewhat from the small planting or the home garden. I have always felt that it is a disadvantage to have too many varieties when it comes to packing and marketing, especially if some of them are not of the best. The question of varieties is a very important one for the planter to consider, for it means the difference between success and disappointment, so I say again that varieties best suited to the various districts of Ontario should be planted, also having in mind our possible markets for the fruit.

There is a considerable variety of soil in our district, running from light sand to heavy clay, but the soil that suits apples would be a sandy loam. There are one or two orchards that are on sandy loam—and not a very deep loam—with a hard bottom, and they certainly produce good fruit, plenty of it, and of a good color. A soil that is too heavy is not good for the best production of apples, but a moderately heavy clay loam will produce good fruit, there is no question about that. I am not sure that I have a choice as to what soil is best adapted to the different varieties. I hardly feel that I am qualified to go into that feature of the business.

I would first recommend the Duchess. This apple, I believe, is the best early apple, and the most profitable if handled properly. It also allows of different methods of marketing; we can put it in baskets, boxes or barrels, and it finds a ready sale.

Second, I would take the Ribston Pippin as the best fall apple. I have been told that the Ribston of our district is second to none in the Province. The Blenheim Pippin is a good second being larger in size than the former.

Third comes the King which does very well if top-grafted on some hardy stock, such as Baxter or Stark. This has a tendency to make it bear earlier and more regularly, and that is its bad fault.

Fourth is the Northern Spy which is called by some "The King of Apples," but certainly it is the best seller in Canada, although not always in the British market. The King very often outsells the Spy, and very often the Spy does not

sell as high as the Baldwin or the Greening. Some claim there is no difference in Spies, but there is certainly a great difference in them. We want to get the Spy with the color, and the nearer our nurserymen get to the point of producing a Spy variety that will give us a good rich color, the better it will be for the growers.

Fifth is the Baldwin which is one of our good standard red varieties, and is a good cropper and shipper. I understand that several people have discarded it, but in our district it has been successful, and we feel we cannot do without it.

Sixth is one of our standbys—the Greening, which is really a better quality of apple than the Baldwin, but is objected to on account of color and being subject to scab. Red apples will sell better than green apples, but for quality the Greening is ahead of the Baldwin.

Seventh is the McIntosh Red. It is in favor with many growers as a fancy or dessert apple, and if we are inclined to cater to this trade it is one that ought to be used.

Eighth is the Snow Apple, which is also a very desirable dessert apple, and is one of our oldest of this class, and a really well-matured, good specimen of Snow Apple is hard to beat.

Ninth is the Wealthy. This is a very good cropper and a good seller.

Tenth is the Wagener, which is a very desirable apple, and perhaps should be better known than it is. It is an early bearer, and the fruit is high in quality and has good keeping qualities. It seems that our local markets do not know the Wagener as well as we think they should. My own opinion is that the Wagener is just as good as the Spy for quality. For home use, we prefer the Wagener instead of the Spy.

These last two varieties can be used as fillers very profitably, as they are early bearers and the trees do not get to be a large size.

Now, while I have named ten varieties as the best for this district, it must still be decided by the grower how many of them are likely to suit his conditions as to soil, season and markets. Finally it is presumed that the most thorough cultivation, pruning, spraying, etc., will be given the trees, because it is only by combining all that the orchardist can expect to produce a satisfactory crop. And then the all important question of marketing has to be solved before the grower receives the price he should, to pay for the cost of production.

G. Mitchell, Thornbury.

The market as it is and has been for the past few years is demanding apples of good size, and we consider that nothing but the best varieties should be planted, as there are too many of the poorer classes now. For this northern section, for fall varieties would say Duchess, Gravenstein—which does well here—St. Lawrence, Alexander, Wolf River—all red fruit with the exception of the Duchess. For late fall, possibly a few Ribston and plenty of McIntosh and Snow. For winter, the Spy, Baldwin and Greening. They are standards always.

F. B. Lovekin, Newcastle.

I live down near Bowmanville on the Lake Shore. Our land down there is pretty heavy, and possibly the varieties of apples that would do well at Burlington would not do as well with us, but I can tell you which are the best apples for our district in a commercial way.

To begin with, in the commercial orchard, a man may have too many varieties. I think seven or eight varieties are enough. I have 10,000 trees, and there are too many varieties among them. If I had to plant again what I did ten years ago, I would concentrate on fewer varieties. If we are going to make any money out of apples, we have to grow the best quality of fruit to be put on the market. We do not want to take second place to the man from Washington, Virginia, British Columbia, or any place in the world. We have the variety of apples that will grow on the lake shore of Ontario and will hold their own any place.

Again, there is not much use in our district planting a great deal of summer fruit, because all this country to the west of us is three or four weeks ahead of us, and they supply the city trade, and can ship their fruit by boat to Winnipeg and the West which is a cheaper haul. So I do not think it is worth our while growing Red Astracans, because we cannot put them on the market early enough.

In my opinion the Duchess is a splendid variety, because it is an apple that will sell any time on any market, and commands a big price at any time. We are perfectly safe with the Duchess, but the principal trouble is to get enough of them together of good quality to make a carload shipment.

After the Duchess, the Alexander is a good apple, but I would not put it in the same class. It is the alternative. It is a good apple, and will always sell in the Old Country market.

Then I would take the apple which has not been in cultivation as long as the Alexander, and that is the Wealthy. I think it is a world beater as a money maker. It is an early bearer. It is as hardy as a Siberian tree, and it will bear heavy crops of fruit alternate years, that will sell at good prices. I would plant a considerable number of the Wealthy.

After the Wealthy, I take the McIntosh Red, which is another kind of Snow, and I think it is perhaps the coming apple for the man who can get it on the market in good shape. But it is an apple that has to be well cared for and well sprayed.

For my part, I think the old Snow is the best apple in the world, and I believe a good quality of Snow is better than the McIntosh.

After these varieties, we strike the winter fruit. I believe the Baldwin has raised more mortgages and cut off more debts than any other apple planted in this country, and it will continue to do so. It does well in our heavy clay soil where we can dig six or seven feet and find nothing but clay bottom.

The Spy does remarkably well with us, and they grow as large as Alexanders on young trees. The Spy is not planted as extensively as it should be. There is nothing like it grown in North America, and there is nothing that can beat it in the world, and we should have ten or fifty times more Spies than we have to-day. The Spy apple is a long liver. If you have a tree that will bear fruit when it is two or three years old, you have a tree that will die when it is young. The Ben Davis are dying out all over this country, and it would not hurt anybody if they all died. They have made a lot of money for many people, but they have not built up our reputation as growers of fine fruit, and that is what we want to do.

These are about all the varieties I would plant. I would plant nearly half the orchard of Spies, and use the Duchess or Wealthy as quick bearing varieties—or anything you can get going until your Spies are ready; and with twenty acres of Spies you have the best thing you can get. You must dig up the ground and give them plenty of air and sunshine, and the Spy tree also needs a great deal of persistent pruning.

Q.—What is your system to keep the Spy bearing?

Mr. Lovekin: Give them light soil, and they will bear more quickly than on heavy soil. I know of Spies that will give good apples at ten or twelve years of age.

Mr. W. F. W. Fisher: Has the system of pruning anything to do with the bearing?

Mr. Lovekin: A young man came down from the College and worked for several years on some young trees of mine. I have not seen the apples, but they will come along and bear after awhile; but when the Spy tree starts to bear, you will have plenty of apples.

If you want to add to the list, you might plant the Russet, Ribston Pippin, Greening and King. I would not advise planting that many varieties.

Q.—Would you recommend planting out 5,000 Spies in one block, or would you put some other variety with them?

A.—I would suggest something with them. I would not plant them alone, because they are so long coming to bear that I would plant some quick bearing varieties with them.

Q.—If you planted them alone, would they mature and bear all right?

A.—I have no good reason to think they would not. I know a little Spy orchard that turns out $2,000 net, and there are nothing but Spies in the orchard.

Q.—Does a No. 1 Spy command more money than No. 1 McIntosh?

A.—The McIntosh would bring a pretty good price. I know the McIntosh in the Montreal market for the last ten or fifteen years has always brought a good price. Of course the market is usually at a different time of the year from the Spy. The beauty of the Spy is that it will keep, and you get the best price in March and April.

Q.—The McIntosh won't keep?

A.—Yes, they will keep.

Mr. Fisher: How much do you prune?

Mr. Lovekin: I do not prune for three or four years. Maybe I prune too much. I think myself that probably persistent pruning has a tendency to make the trees run to wood and not to fruit.

Chas. M. Macfie, Appin.

There seems to be a uniformity of opinion on the part of those who have addressed you as to the number of varieties to plant. The previous speakers have referred to apples which I have on my list as being recommended for planting in the district from which I come, and our experience in connection with the marketing of these is that there is a demand for the apples which have been referred to, and that demand on the part of the consumer is one of the great factors that we ought to consider in connection with our planting. Two or three years ago last fall, when we had a surplus crop all over the Province, I might say that Mr. McCarthy, whom we all know, if not personally, at least well by reputation, was trying an experiment in his own orchard, and what he could not sell he turned over to the Association to which I belong. If the demand from the individual consumer is a criterion as to what we should plant, then what has been said with reference to the Spy is certainly true. We can make no mistake in planting the Spy now or for years to come, and need have no fear of overdoing it.

I have nothing to say in reference to the McIntosh Red. We do not know it in our immediate locality. I believe in some districts not far from us, like the county of Middlesex, there are orchards in which it is produced successfully with the care that any variety ought to receive.

We can grow the Snow successfully, athough not very many of the trees are producing. A large producer in our locality, and perhaps the largest from the commercial standpoint, is the old standby, the Baldwin. We never have any difficulty in connection with the marketing of the Baldwin, and we have perhaps less difficulty in growing them of good color than any other fruit, although I believe in the Baldwin, as in the Spy, there are different strains of fruit. My experience would lead me to believe that on the lighter soils you get a richer and better color in the Baldwin, and of course that renders selling easier.

I have a word of commendation for the Wagener, although it is not a thrifty tree, but it is a good apple in filling a young orchard. It comes to maturity quickly, and being a quick maturing tree, it is a quick dying tree as well, and goes out of production just when the Spy is coming to its best. Consequently it finds a place in the orchard.

As far as our personal experience is concerned, we use the Wealthy and find it a splendid apple for home use, and it is too bad for the sake of the variety that it is not better known among the consuming public.

I have made a list, as the former speakers have, of the varieties in the order of their production. The first is the Duchess, then the Wealthy, the Alexander, the Blenheim—which is a good producer with us and a good seller, and an apple that is more easily kept clean than any other variety in our locality. Then follows the King. One great objection to the King is the fact that it is not as prevalent a producer as some of the other varieties. For the quality of the apple and from the standpoint of production, I think the King has not in the past commanded a sufficient prominence on the market.

We have one other apple that is perhaps not very widely known, and that is the Jonathan. It is an apple of rich color, is a splendid dessert apple, a good producer and a very attractive apple in every respect to put on the market. The man who buys it will come back for it.

So far as individual requests for apples to-day are concerned, I might say that some of those to whom we sold apples two or three years ago have come back, and it might interest you to know what have been the requests from the individual consumer. I have just taken a list from our list of sales: Spy, Rhode Island Greening, King, Baldwin, Golden Russet, Tolman Sweet, Milwaukee, Bellflower and Snow. We did not get very many requests for the Bellflower, yet there are some people who seem to like it and think it is a splendid dessert apple. There is a prejudice against it because of the tenderness in the way of marketing. Our own experience is that a long-stemmed apple will remain on the tree perhaps longer than any other apple in the orchard, and should not be pulled until the last apple in the orchard, and it does not become so tender and presents a better appearance in packing. However, I would not recommend it as a commercial apple for packing.

There is one other apple in connection with these varieties and that is the Chenango. With us it is an apple beautiful in appearance, superb in its quality, and once placed on the market will lead the consumer back to it. It is almost as good as the Wealthy in its keeping qualities. It has a little tendency to grow in clusters, and it responds to thinning admirably. It is an easier apple

to produce than the Wealthy, and you will get more Chenangoes from year to year than Wealthies.

With reference to the Wolf River, I think they have been pulled too early in the season. There is a little tendency on the part of the Wolf River to decay on the tree, but that can be overcome by cultivation. I have seen an orchard that looked to me to be deliberately neglected and yet produced an abundant crop of Wolf River of uniform size, and it happened in a season when the grower had no room for them. They were holding to the tree—a magnificent apple—in the middle of October, and in marketing condition at that time. The dealers used to pick our Wolf Rivers in September when the apple was not fit to go on the market in condition to attract the consumer. The appearance was attractive, but the quality was anything but attractive and not calculated to bring the consumer back for the apple, but if it were given a little longer time to mature before marketing, it would produce better results.

THE NECESSITY FOR NEW APPLE ORCHARDS IN WESTERN ONTARIO.

Prof. J. W. Crow, Ontario Agricultural College, Guelph.

It has been apparent for some little time that the apple orchard industry in the western part of Ontario, and in fact, in some other parts of Ontario as well, is not prospering as it did some years ago, and I suppose one of the lessons we learn from that is that time, places and conditions change. However, I think perhaps there are very good reasons why the orchard situation in Ontario is as it is to-day, and one of the important reasons which I would like to bring to your attention is what you might call "reaction." I think perhaps most of us have had enough experience and opportunity of observing the changes in the business to realize that there is a tendency in the production of apples, as in other things, to pass through certain cycles of over production and under production.

Going back to the year 1896, we find that year gave us the heaviest crop of apples we had experienced in this country up to that time. You may remember, too, that the crop of 1896 rotted on the ground—a record crop that sold for very, very low prices or were not sold at all. 1896-7 were the two years when the prices of farm products generally over North America were at their lowest point. That was twenty years ago. About the year 1900 a few wide-awake men in the Province of Ontario saw the opportunity of making money in apple orcharding. They went to work mostly by renting other people's orchards which were standing idle and producing little or nothing. Some few men in the Province made money out of that business, and their example stirred up other people to do likewise, and growing out of that, in a very natural way, came a sort of boom or widespread propaganda in apple orcharding. That began about the year 1900, although it did not resume marked proportions until about 1905.

From 1905 to 1910 everybody talked apples, and most people planted them, and there were thousands of apple trees set out in this Province. That was, I think, a boom condition and not a permanent condition of affairs at all, because it is obvious to anyone that the apple orchard industry cannot continue on that basis indefinitely.

We find that in the year 1912 we again reached a point when apples were produced in abundance and rotted on the ground. 1914, if I remember correctly, gave us somewhat of the same condition. The years since 1914 have not blessed us with abundant crops. 1915 and 1916 were two very bad seasons, known as the worst that ever happened from the standpoint of weather conditions and fungus pests and so on.

Now the point I want to make is this: Twenty years ago, 1896, we were at the point of over-production with a limited market, and while since that time the markets have extended a very great deal, we are pretty nearly all the way around the cycle again. We have had the boom condition and the fall, and we have been up to the top in 1910 and pretty nearly at the bottom again. I do not think it is out of the way to say the apple orchard industry has declined and is in a more or less neglected state. I think that is the truth, and I want you to realize that this thing goes in cycles of ups and downs. We are now at the point where if there came a real record crop, it would not go to market. We could not handle it. Do you realize that the years we call the most disastrous years are the years of the heavy crops? Do you ever think of that? We like to have a big crop, and if you have a big crop when nobody else has one, you are all to the good; but usually when you have a big crop everybody else has a big crop, and we have just about reached the stage when a big crop would not go to market. We could not handle it, and we are nearly to the point when people are going to begin again to take a big interest in apple orchards and planting trees.

Another factor which has to do with the present condition of the apple industry in Ontario is the fact that most of the orchards throughout Western Ontario are small in size. If you will look carefully over the orchards in the Province of Ontario from one end to the other, you will find that the orchards to-day which are receiving care and attention are good sized orchards—orchards big enough to make it worth the owner's while to look after it. And the orchards which have passed into a state of neglect are the small orchards. I believe that is the correct diagnosis, and if it is correct, it means there is something about the small orchard which is not economical and not conducive to keeping that orchard in a state of productivity. I believe, therefore, that our orchards are too small. There are numbers of men who have temporarily dropped apple growing. The trees are standing there, but they are not sprayed or pruned.

Q.—Where would you draw the line?

Prof. Crow: With the man who runs the show. There are plenty of men who at the present time have dropped the orchard temporarily, but who if they had more trees would be better off. They may think they have too many when they have three or four or five acres, but if they had ten or twenty, they would have enough to make it worth while caring for.

One point in which perhaps we have erred and gone wrong is the way we went at it to stir up this boom in apple growing. There was as you know a great deal of talk about apple orcharding, and emphasis was given to the profits certain men had made in fruit growing. That is all right if you take it right, but it may be very misleading, and that is where we made a serious error.

During the years from 1905 to 1910, there was too much of a tendency to look at the orchard on a farm as the unit. We have gone after the man with the small orchard and preached into him that he ought to take care of his orchard as if it were the principal end of farming, whereas the farmer is thinking

of his whole farm as the unit of production and not the apple orchard that occupies one corner of it.

I want to base this statement on the remarks I have made up to the present: I believe that the present is exactly the right time if a man is properly situated, to plant an orchard, and if there ever was a necessity for a campaign in production we have an instance of it right here, because from a national standpoint, if we do not look after our apple orchards and encourage the planting of more orchards, our apple orchard industry is going to fade—I won't say out of sight, but it is going to fade. We want to persuade men to plant apple trees, but we must pick the men who are rightly situated to do it, and who are in a position to plant a large enough orchard to make it worth their while. Five years from now under normal conditions and even under war conditions, should they continue that long, the public generally will be waking up to this opportunity in the apple business. That is self-evident and is no prophecy.

For some years in Ontario, there has been a sort of campaign in marketing. We have thought, and it has been freely stated, that the problem in fruit growing was not the growing of the fruit but the marketing of it. I would bring to your attention the fact that great progress has been made in the marketing of all kinds of fruit in this Province in the last ten or fifteen years. We have progressed so far in marketing that we have come to the point where the problem is once more the growing of the fruit, and my impression is that the general fruit grower and apple grower in this Province has much more to learn about the growing of the fruit and the selection of the varieties and the management of his orchard. We have made tremendous strides in marketing. We are doing things now that ten or fifteen years ago would not have been attempted, and which under those conditions would have been out of the question.

Just as an instance of that. The Niagara District peach crop of 1913 was a bumper one, and if it had come ten years previous, it would have spoiled on the ground, but the peach crop of 1913 went to market, and although the prices were not as high as they might have been, it was moved and sold—the biggest peach crop the country ever had.

We are marketing apples in the West by co-operative methods through the various Associations and the Central organization, in a manner that we would not have thought possible ten years ago. And the problem to-day is the growing of the fruit. That point is emphasized somewhat by the character of the season of 1915 and 1916. It was very difficult to get spraying done, and yet there were clean apples grown in the Province in fair quantity in both of these seasons.

I would like to direct your attention to some of the causes which have played a part in bringing about the present condition of affairs in the apple industry. The first is the small orchard. I believe the day of the small orchard is over, and perhaps it would not be too much to say that the small orchard is the curse of the business. When conditions get down to a certain point, the men with small orchards stop caring for them for ten or fifteen years, and then when they want to, they can bring them into cultivation again. There can be no more disturbing element in fruit growing.

Another point is the matter of varieties, and I have listened with much interest to what I have heard of the discussion of varieties. I do not need to add anything to that at the present time. For my own part, I want to say that I do not believe the Northern Spy apple is half as profitable as some have stated. I believe it is the most difficult to grow and one of the most expensive.

There is another point I would like to mention which has been a source of very great difficulty. You know the extent to which trees have been winter killed in various fashions. One of the principal means by which trees go out in this way is root killing. An interesting point in this connection is root killing is worse in the southern counties than in the northern where they have more snow. There is more root killing in the county of Kent than in Huron or Bruce or Muskoka, because in the latter there is a heavy blanket of snow. I believe this can be avoided by growing trees on hardy roots, either on their own roots or grafting then on to some other variety. The Spy is a very hardy tree. It will grow in a country where the Baldwin or the Greening will not. The Baldwin is not satisfactory on its own roots, but I will guarantee it will live longer and thrive better top grafted, because we have thousands of Baldwin trees going out with root killing. This is a problem for our nurserymen, however. If you want a tree on strictly hardy roots, and if you want to pay the price, there is no reason why you should not have it.

There is an important way by which all this root killing can be avoided, and connected with that is the matter of top grafting such varieties as the Baldwin. When the Baldwin tree goes out at twenty-five years of age, there is something radically wrong. There are a great many places in Ontario where the Baldwins are going out at twenty-five years where they ought to live longer, and where they would if they were top grafted. You want not only hardy roots, but hardy trunks.

Q.—How old should a tree be for top-grafting?

Prof. Crow: You can top graft a tree at almost any age from three years planted up to as far as you like, but my impression is that the best time to top graft a tree would be seven or eight years planted.

The Chairman: I am sure you will agree with me we have listened to a very excellent address from Prof. Crow. I am ready to agree with Prof. Crow that the fruit industry has reached that stage when we have gotten over this panicky attitude, and we are ready now to go ahead and profit by the lessons we have learned.

Prof. Crow: Mr. Carpenter, who is a nurseryman, has asked me what I mean by a tree on its own roots, and wants to know whether I am talking of the growing of trees from seed. The point is if a nurseryman would use short pieces of root and a long scion and plant it deep, the scion will develop its own roots eventually.

Mr. W. F. W. Fisher: There is one point I would be interested in hearing developed. Is there any way of treating an orchard that will lead to its early productivity? My observation in the West is that one of the reasons why they get early productivity of trees is because they do not prune them. They plant a tree and go away from it, and leave it for eight or ten years, and then they have a tree in full bearing for its size, and then they prune them very heavily. I have never seen their orchards pruned very heavily in the West. We have been pruning somewhat heavily on all the varieties of fruit we grow—apples, pears, plums and cherries—for the last few years. We have started off on that principle, that we are going to leave the tree without any branches that come in the way of working the land. We have known that the lower buds are the ones that are the best to bear fruit, and by the system of pruning we remove those buds and it keeps delaying the trees, according to this theory, from coming into bearing. Now, we hope that will establish the bearing habit earlier in life, and after that is once established fruit bearing spurs will come on more regularly.

PROF. CROW: I would say that it does on general principles. I have been interested in the varieties that have been discussed, and to my mind the only thing new has been the recommendation to plant Chenangoes. They are not grown in our district, but I think it would be well to include them in our varieties.

PROF. MACOUN: Prof. Crow does not think there is a place for the small orchard, but I am a great believer in the small orchard near the city or town. I believe the time is coming when the market gardeners are going to grow more apples than they are now. Quite a number of market gardeners have a number of early bearing varieties, and these are the best kind that market gardeners should handle, and I believe there is a great opportunity for market gardeners all over Canada in this respect. I agree with Prof. Crow that the average farmer with the small orchard does not look after it, but the market gardener and the truck gardener will look after it.

MR. PATTERSON: I believe Mr. Fisher is absolutely right about not pruning. Certain experiments have been conducted at the Vineland Farm for the last five or six years, and comparison was made between the trees that were pruned severely, pruned very moderately and not pruned at all. The trees not pruned at all were away ahead of all the others; there was no comparison both in girth of trunk, in size of branch and size of tree. Experiments along this line are almost conclusive in regard to the early bearing, and I think it is right not to prune trees at all until they have had six or seven years of growth.

MR. PALMER, Vineland: I would like to qualify the remarks of Mr. Pattison. The biggest difference is between the winter pruned trees and the summer pruned, but between the well pruned and unpruned trees there is not the same big difference. Taking everything into consideration—the shape of the tree and the general health of the tree—I think that the semi-pruned is perhaps the better state, the trees are a better shape and not leaning away from the prevailing winds, and are not as straggly as the unpruned trees, but as far as the experiment is concerned, unpruned trees are out-bearing the summer pruned and winter pruned, and outgrowing them in length of branches and girth of trunk. Against that must be set the fact that the unpruned trees are straggly and the branches are very thick. In two or three years there won't be any buds in the centre of these trees; there is too much shade.

THE CHAIRMAN: The tendency will be that we will go too far the other way.

REPORT OF THE HISTORICAL COMMITTEE.

A. W. PEART, BURLINGTON, AND W. T. MACOUN, OTTAWA.

In 1914 and 1915 the report of this Committee set forth the more important events connected with the growth of the Ontario Fruit Growers' Association. As the main features of that field have been, for the most part, well covered, we propose to confine ourselves this year very briefly to the remarkable season of 1916 as it affected the fruit grower. It has been well said that everything has been abnormal and out of gear. The war was and is still raging and assuming even larger proportions. The spring and summer were phenomenal in their destructive effects on the fruit grower and farmer. Incessant rains until the last of June waterlogged the soil and largely prevented the usual work on our farms. Orchards if ploughed at all were ploughed wet—if cultivated, were cultivated wet—and in

any event the soil was lifeless, chilled to death and with it trees, bushes and vines.

Then came a drouth of three months, with intense heat. The soil baked quickly, and probably within the memory of man land was never so stubborn and hard to handle. The rains interfered with the setting of the blossoms of the larger tree fruits, and as a result there were short crops of apples, pears, and plums. This was aggravated by the impossibility of effective cultivation, so that the apples were small, defective and of low quality. Strawberries on light and well drained soils were a fair crop. Raspberries, poor; cherries in too many orchards were destroyed by the cherry fly: pear trees were attacked by the Psylla, and the San José Scale spread rapidly. Very seldom, if ever, was the apple scab so bad as this year.

But amid the general desolation there was one bright spot—prices were good, as well they might be, for the grower had little or nothing to sell. Cherries climbed to old time prices 75c. to $1.50 per 11 qt. basket; plums 75c. to $1.00; pears brought good prices in our home markets, and if you could get them across to Great Britain, sold at record prices; apples $1.25 to $1.75 per box f.o.b. for No. 1 and 2, and $2.50 per barrel for No. 3. Winter Nelis pears sold in Glasgow last October as high as 13 shillings per one-half standard box, and King apples at 16 shillings per box.

During 1916 commercial dusting was tried in a few orchards instead of the usual spraying to destroy insects and fungi. The results were such as to inspire the hope that this method might become generally effective. The relative lightness of the outfit and the rapidity of the work are strong factors in its favor.

In the winter of 1915 and 1916 thousands of young fruit trees were girdled by mice, involving a heavy loss to many growers. Those who promptly protected the wounds with burlap, then bridged them with scions when vegetation started and used grafting wax freely, were able to save many good trees.

This is the third annual meeting since the beginning of the war. During the past year many of our sons have seen active service at the front. Some have been wounded, others again have paid the supreme price. We all fervently hope that this dreadful nightmare, this foul blot on civilization, this brazen challenge to Christianity itself may soon be ended, and that the British Empire with her allies may emerge successfully on a basis of permanent peace rooted in honor and justice.

During 1916 two strong men officially connected with the fruit industry have passed away. The Hon. James S. Duff, Minister of Agriculture of Ontario, died near Cookstown on June 20th. He represented West Simcoe in the Provincial House for eighteen years, and was one of the most able Ministers the Province has had. Mr. Duff was a successful farmer and a practical man, bringing to the responsible duties of his position as Minister, useful progressive ideas and shrewd common sense. He introduced the system of County Agricultural Representatives, School Fairs in rural districts, the merging of Farmers' Institutes into Clubs, Agricultural Travelling Demonstration Trains, various acts for the betterment of the live stock and dairy industry and was a good friend of the fruit interests of the Province. Both his public and private life were marked by simplicity, rugged honesty, and devotion to duty. He was genial and sympathetic, and his demise which was universally regretted was doubtless hastened by the shock of the news of his son having been killed in France while fighting for Canada and the Empire.

Dr. C. C. James, Canadian Commissioner of Agriculture, died suddenly on June 24th. From 1891 to 1912 Dr. James was Deputy Minister of Agriculture

of Ontario. During the latter year he was transferred to the wider Dominion field. At the instance of the Hon. Martin Burrell, Dominion Minister of Agriculture, he directed the Patriotism and Production Campaign in 1915 throughout Canada, and the Production and Thrift Campaign in 1916. Dr. James was a close student, and a man of wide sympathies, which, directed by a certain resistless energy and enthusiasm, gave his life a broad usefulness. He was pleasant and approachable, and the fruit as well as other agricultural industries were materially advanced through his work and influence. Dr. James was a member of the Senate of Toronto University, Past President of the Ontario Historical Society, a Fellow of the Royal Society of Canada, and a companion of the Order of St. Michael and St. George. The news of his death was received generally with deep regret.

CARE OF THE ORCHARD DURING THE LABOR SCARCITY.

A. W. Peart, Burlington.

This subject, "The Care of the Orchard During the Labor Scarcity," I consider is a very difficult matter to handle. The care of an orchard under normal conditions is hard enough, but when we strike conditions such as we are likely to confront and have been confronted with during the last year, it makes it very much more difficult to try to say anything about it. Last year we had a hard season from the standpoint of the weather. There was a vast amount of rain during the early part of the year, succeeded by intense heat and drought from July on. That made it so that the fruit grower could with no satisfaction whatever work or handle his fruit plantations and orchards; and, besides that, there was a labor scarcity. I dare say that in our part of the country the farmers are short from 25 to 50 per cent. of the usual quantity of labor they keep. As time goes on men are getting scarcer and scarcer. Recruiting is taking more and more of our men, as also are the munition factories. Then there are public works going on which absorb numbers of men and which offer higher wages. The farmer cannot profess to compete with the munition manufacturer in the payment of wages, nor can he compete with the wages offered by commissions of various sorts and by private contractors.

In Burlington district to-day, hired men ask from $2.50 to $3.00 a day, and they would point to sewer works and other public undertakings where they pay laborers 30c. an hour.

That is the situation that confronts us, and it is up to us as fruit growers to meet that situation as best we can. I do not know that I have any special suggestion to offer to you so far as that situation is concerned. We had a very hard year last year due to the season and the scarcity of labor, and if we have normal conditions this season even though wages are higher, we cannot have a worse year than what we have recently passed through.

It seems to me there are at least three things which are indispensable, and which we should make a big effort to try to do on our farms. The first is keeping up the fertility of the soil in order to produce a good crop of any sort. The next indispensable operation is cultivation. We must look after the cultivation of our orchards; at least that is the experience in our district. I understand in some districts the orchards are situated on such exceptional soil that they require no cultivation; but if I were to handle my orchard that way I would produce a very

inferior quality of fruit. I have not only to keep up the fertility of the orchard, but I have to cultivate it as well. The third point is in regard to spraying. These three operations must be looked after—the fertilization of the soil, cultivation of the soil and spraying of the trees.

In regard to the fertilization of the land, my practise is, so far as I can carry it out, to plough all the orchard I can in the fall. What I do not get ploughed in the fall, I plough in the spring. I would rather plough all the orchard in the fall for the general reason that I find with all sorts of crops, grain, corn, mangels, the ground ploughed the fall before retains the moisture better throughout the succeeding year than if it is ploughed in the spring, and I find the same reasoning will hold true in regard to orchards. Last fall I left three orchards unploughed, and at the present time I am drawing stable manure out to those orchards. I got two car loads of manure in December and I am spreading it out under the trees as far as the branches reach.

Q.—Do you plough towards the tree or away from them in the fall?

A.—I prefer to plough towards the trees unless the ground is very uneven.

Q.—You would not be afraid of tearing the roots?

A.—As I say I prefer to plough to the trees; the orchards I ploughed last fall I ploughed away from the trees and left three or four rows to the old trees. I would not care to tear the roots.

Q.—What depth do you plough?

A.—Five or six inches.

Q.—Depending on cover crops in adding humus to the soil, what would you do?

A.—If I find time to plough it in the fall, even with a cover crop on, I would do so for the sake of keeping moisture in the soil. If I plough in the spring I do not seem to be able to keep the moisture in the soil.

Q.—You would have to turn your cover crop in pretty early?

A.—In the middle of July.

Q.—That would not do for a young orchard?

A.—In a young orchard we expect to grow something else besides trees, of course.

Q.—Take an orchard 18 or 20 years old, would you advise ploughing right up to the trees or would you leave three feet or a greater amount next to the tree?

A.—I always plough right up to the tree.

Q.—Some people find it an advantage to leave 10 or 12 feet?

A.—I daresay there are some grounds and some lands where a person can do that without sacrificing the size of the apples, and it might tend to make the apples a better color to leave a strip of 10 or 12 feet in width. Some people say it tends to make a better color in the apples, but whether that is true or not, I do not know.

Q.—I did not mean that exactly. The small feeding roots in the trees are not very close to the trunk, and according to the size and age of the tree, would you plough close to the tree or leave a strip? That is, with a young tree would you plough close and as it grew older leave a little more ground?

A.—Some say that is an advantage; but I plough right up to the tree, though not deep, and the farther I get away from the trunk, the deeper I plough. But your point is leaving a strip of sod that you do not plough at all. That would not suit my orchards. I require to cultivate all I can to get any sized apples. In regard to cultivation, I like to put the roller around as soon after I plough as possible, and then put the harrow over the ground.

Q.—What kind of soil have you?

A.—Clay loam and gravel loam. As soon as the ground is fit to work in the spring I like to get on it with a disk and then the harrow. I give it the same treatment as a field I was going to sow with oats, as far as the harrowing is concerned. If we leave it as the disk leaves it, there is greater evaporation in the surface than when left after the harrow.

In regard to spraying, I believe last year was a great revelation in some parts of the country in regard to the quantity of injurious insects and fungi we have to combat. In my own orchards for the first time to any great extent, the aphis did as much damage as it possibly could. The fruit was small and the leaves were blackened, and in cultivating that orchard crosswise with a team during the months of July and September, a certain amount of water or honey dew would be swept off the trees on to the horses.

Then again, the Cherry Fly developed very largely in the cherry. The San José Scale developed very rapidly, and we were also troubled with apple spot or scab. So in addition to these other two operations, spraying is absolutely essential.

I have not had any experience with the new dusters, but the fruit growers are hopeful that the dust method of treating trees for fungi will be satisfactory. Last spring and summer it was practically impossible to spray our trees properly on account of the soft ground and the rain, and I have no doubt that is one reason why the fungi and the scab in the apples was so prevalent.

Orchards have also to be pruned in order to get fruit worth picking. Raspberries and blackberries should be pruned, and I think young orchards generally should be gone over and a little taken out of them, but at the same time, I agree with the opinion expressed here that we should not do too much pruning on young trees.

Q.—If you do not prune a young Spy tree what kind of a tree are you going to have? It will grow 20 feet higher in the year?

A.—Every rule has exceptions, and I dare say the Spy tree is the exception. I agree with you that young Spy trees make a vigorous growth in a single season, and it has been my practice to cut those growths back always.

There were thousands of trees in the Burlington district ruined with mice. Some of us went to work and tied up the wounds with burlap so that the sun and the wind would not dry out the tree. We tied the top and the bottom of the scion with twine, and then we packed the wound up with grafting wax and in that way we saved a number of good trees which would have been ruined.

Q.—Is there a particular time for doing that work?

A.—I do that about the middle of June.

Mr. Falen: If you have clean cultivation and your fences clean, you would not have any mice.

Mr. Peart: Unfortunately our fences are not always clean, and we cannot always have clean cultivation, but I agree with Mr. Falen.

A Member: Even with clean cultivation the mice worked through on my orchard?

A.—They were certainly very bad. I know orchards where hundreds of trees were destroyed. I think it would be well for us to go over our trees and put on tar paper.

Prof. Crow: I do not see where you are saving a great deal of labor on that orchard.

Mr. Peart: The point I want to make is this: We are up against a situation.

There are certain indispensable things to do, but we could cut out thinning, although the thinning of certain varieties might be profitable in normal times. I do not think I would consider that this year at all. So far as possible, the fruit growers and farmers should confine their energies and work to things absolutely indispensable. Leave out the non-essentials, and just get along the best we can under the conditions we are up against.

Our boys are fighting at the front, and they are making a good fight and bringing honor to Canada. It is up to us who are here and not at the front to also make a good fight in our work whether it be in our orchards or on our farms, and be a credit to our boys who are at the front.

THE CHAIRMAN: The question has just come up in regard to mice damage. Has anybody had any experience in the application of a strong lime-sulphur solution applied to the trees as a preventative?

FATHER LEOPOLD: I tried that out in the fall, and where we have put that on the mice have not touched, but this is the first year of using it.

PROF. MACOUN: There is a method of cultivation called the Johnston System which saves half the expense of the operation of cultivation, but whether it is practicable to this part of Ontario or not, I cannot say. In this method every other row is cultivated. Supposing you have a cover crop of clover in your orchard, next spring instead of ploughing up the whole orchard, you plough up between every other row, and in that way you save half the seed, half the expense of ploughing, and half the expense of cultivation, and they claim in Nova Scotia they get a better quality of apple and sufficient moisture to produce apples of good size.

THE CHAIRMAN: Mr. Gibson, would you mind explaining to us the system you have of leaving the trees with a strip of sod?

MR. GIBSON: Our object in doing it is saving labor. We keep the orchard in clean cultivation until the tree is nicely in bearing, and then we sow a strip of clover perhaps 10 or 12 feet wide. If the rows are 35 feet apart, that leaves 25 feet for cultivation out from the branches, allowing the branches to drop down over this sod strip. A lot of the apples are low down and within reach of the pickers, and so far I have had sod strips that have been in continuous sod for 15 or 16 years and the trees are making plenty of wood. By the cultivation of the centre, we get plenty of moisture, and I am sure I am getting a better quality of apple, and the trees go into winter with wood better ripened by having this portion of sod around them, and there is apparently no winter injury.

MR. TERRY: How would you cut the grass if the trees are so low?

MR. GIBSON: With the mower. We cut back the limbs pointing sideways so as to allow the horse to go past.

Q.—Have you any injury from the mulch?

A.—No, but it has a tendency to harbor mice, but so far we have had very little injury from mice.

FALL PLOUGHING.

W. F. KYDD, TORONTO.

At many meetings like this the question has been often asked about fall ploughing, and not so very long ago there seemed to be a great difference of opinion about it. I am glad Mr. Peart spoke the way he did, because it makes me stronger in my ideas on the subject.

For a number of years the Fruit Branch has had orchards in different parts of Ontario. In three of these orchards from the very beginning some fall ploughing was done every year. We find in the spring cultivation the labor does not cost half as much if the orchard has been fall ploughed, and it is easier to keep the ground clean. We also found we had greater wood growth with fall ploughing than with spring ploughing. I suppose the reason for that is that we were able to keep the ground moist during the summer. I would advise fall ploughing to be done as late as possible so that there will not be any chance of any growth starting in the tree.

Of course fall ploughing does away with the cover crop for winter protection, but if you have your ground ploughed in the fall and harrowed, you have five or six inches of mulch, and I believe that is a good preventive from winter injury to those roots.

Another thing I would advise is ploughing towards the trees. I do not believe in leaving anything resembling a dead forest around those trees.

Mr. Peart has covered the ground so thoroughly that I can hardly add anything to what he has said, but I would be pleased to answer any questions.

Mr. Falen: Do you ever plough away from the tree?

Mr. Kydd: No; never away from them.

Q.—What kind of plough do you use?

A.—Any kind, as long as it is easy to handle.

Q.—How many furrows?

A.—Generally one.

Q.—That would be pretty slow if you had a great many trees?

A.—I would use two, then, or more than one plough.

Q.—Would you advocate ploughing every fall?

A.—If I am going to do spring cultivating every spring I would advocate fall ploughing every fall.

Q.—How deep do you plough?

A.—Pretty shallow, because as a rule these orchard trees have not been cultivated, and if you plough five or six inches you are apt to give them an awful shock. There are a few orchards that are never cultivated at all, and they have splendid results. I know of an orchard near St. Thomas where there are splendid crops of Snows and McIntoshes every year, and it has not had a horse work on it for the last twenty years.

Prof. Crow: Would you fall plough sand?

Mr. Kydd: Sandy land would not need fall ploughing nor spring ploughing. A disk would do all that was necessary.

Mr. Allen: As far as I am concerned I am never satisfied unless I have all my ploughing done in the fall. I find with the land ploughed you are no more susceptible to frost than the man who has his mulch. As Mr. Kydd has stated it certainly lessens by 50 per cent. or more the labor in the spring. When you plough up your land you have a loose mulch, as Mr. Kydd has stated, and the road adjoining your orchard may be frozen hard, but your orchard will not have nearly the depth of frost in it.

The reason for late fall ploughing is to get rid of the mouse trouble. If you plough early or not at all the mice will have their homes in there by the scores, but if you go in as late as possible in the fall to plough you are going to be pretty hard on the mice, as Bobby Burns said, and clean them out to a very great extent. And we find also when we plough to our trees we eliminate this difficulty with mice.

MR. W. H. BUNTING: In the last few years I have practised all kinds of methods. I have given mulch a trial, clover as a cover crop, and also fall ploughing, and I have found that they have all been good, but when I come to my work in the spring, if I have done a good deal of fall ploughing I am very much ahead.

MR. ROBERTSON, St. Catharines: I have a little farm, and it is in an exposed position. Practically all my loss has come from allowing the land to become bare during the winter by the snow blowing off, and I would never advocate fall ploughing on my farm. I lost 90 per cent. of one orchard with fall ploughing, whereas in another orchard with a cover crop I lost practically nothing.

MR. KYDD: Is it necessary to cultivate absolutely close to the trunk of a full-grown bearing apple tree? Is there any need of going within three feet? Is not that the most expensive part of the cultivation?

MR. ROBERTSON: It is the most dangerous.

MR. KYDD: You can almost have anyone do the cultivating if you do not have to go within three feet of the trunk of the tree. I know of several orchards in Ontario where they are not going within three feet. There is one near Oshawa, and the owner has as fine foliage as you could desire, and he is one of the best fruit growers I know of. What is the use of our bothering with that expensive labor? We have tried this thing out in the orchard in Paris. We have some trees standing in 14 feet square of sod, others in ten and others in 3½ and 5 feet square, and last year there was no difference in the color whether they were in the large squares of sod or had only three or four feet each side of the tree.

Q.—Could you see any difference in the blossoms?

A.—We could not see anything of the kind.

MR. FISHER: Would it depend on the size of the tree?

MR. KYDD: It does not make any difference at all.

MR. FISHER: I never made a very great success of growing apples, but the practice we follow and propose following is to plough our orchards both fall and spring with a shallow two or three gang plough, and we find it is the cheapest form of cultivation.

PROF. MACOUN: We adopt the spring ploughing at Ottawa for the reason that our soil is sandy loam, and we had one very bad experience many years ago which we do not want repeated. A very large proportion of our trees were killed in the winter by fall ploughing, and since then we have grown cover crops continually. Of course we adopt the method of growing most of our trees on hardy roots, but for our section of the country—Eastern Ontario—I would certainly not advise fall ploughing.

DOES THE INSPECTION AND SALES ACT PROTECT THE CONSUMER?

A. S. CHAPIN, TORONTO.

In any successful business the chief aim of the management is to give satisfaction to the person using the products of that business, because if the person using the products is satisfied with the products he will use more of them, will increase his orders for them, and the business will benefit thereby.

How can we apply this principle to the apple business?

Simply by giving the consumer satisfaction so that he will use more apples and pay higher prices.

Does the Inspection and Sales Act, as it is to-day, accomplish this? Let us see.

CONSUMERS.—There are two classes of consumers. The first class is composed of those who buy their apples in barrels, such as the farmers in the North-West; and the second class is composed of people in cities, towns and villages who buy their apples by the basket or small measure, or even by the dozen.

In order to ascertain if the Inspection and Sales Act protects the first class of consumers, I must take up the grading of apples under the Inspection and Sales Act as it is to-day.

GRADING.—In regard to No. 1 grade, I will say very little, as it is nearly what it should be, but in regard to No. 2 grade I have much to say.

If there is any man in this meeting, including inspectors, who can tell me what a barrel of apples marked No. 2, contains, I wish he would stand up, and I will willingly go to the expense of having his photograph taken.

I admit that I do not know, and I do not believe it is possible for any person to know, simply because it is a barrel of mixed grades.

If we who pick and inspect apples do not know what a No. 2 barrel of apples contains, how is the consumer to know?

Therefore, I claim that the Inspection and Sales Act, as it is to-day, affords absolutely no protection whatever to the consumer, especially in regard to No. 2 grade. I also claim that it is grossly unfair to the inspectors to ask them to inspect the No. 2 grade, under the wording of the Act as it is at the present time.

If you will permit me, I will offer for your approval a method of grading apples which I have proven to give protection and satisfaction to the consumer, and at the same time to give the highest prices to the producer.

Under the Inspection and Sales Act we pay absolutely no attention to the grading of apples as to uniformity of size and color, and these are two of the most important things in connection with the grading of apples, because we all know that high prices depend, to a very great extent, upon the appearance of the fruit and package.

Therefore, instead of mixing small and large No. 1 apples together, and thus injuring the appearance of the small apples, I would make two grades of No. 1, and mark them Large No. 1 and Small No. 1, but both barrels must contain No. 1 apples in quality.

Next I would take the apples off color, and apples with a few spots, and I would put them in a package by themselves, and mark them just what they are, namely, "Seconds."

We then have nothing left except apples with worm holes, apples covered with fungus or scale, and ill-shaped apples, which are nothing more nor less than dead culls.

It is a great pity our Government cannot prohibit the marketing of culls, as no man can estimate the amount of injury to our first and second grades that is done by the marketing of this rubbish, which should go to the evaporator.

The Government can prohibit the sale of fruit, if it is unfit for consumption, and I honestly believe that if our worthy Commissioner would take a wormy apple to the Government analyst and have it properly analyzed, the analyst would at once pronounce the apple unfit for consumption, owing to the poison injected into the apple by the insect.

However, if the Government cannot prohibit the marketing of culls, it can compel the package to be branded just what it contains, namely, "Culls," in large letters, so that the word could be distinguished in the dark.

As to the cost of grading under the system I have suggested, as compared with the cost under the Inspection and Sales Act as it is at present, I claim that under the system of grading I have just suggested, a man will grade apples in three-quarters of the time he takes under the present system.

Under the present system a great deal of time is lost in the men deciding where the apples should go. For instance, a sorter picks up a good apple with a few spots, and is undecided what to do with it. He holds a discussion around the table, and finally decides to slip it into the No. 1 barrel and take a chance.

Under the system I have suggested, a man knows what every apple is as soon as he sees it. If it is a perfect apple, it is a No. 1; if it is off color, or has a few small spots, it is a second; and if it is a wormy apple, or covered with large spots, or ill-shaped, it is a cull, and he knows just where to put every apple, and can go along with the grading without any discussion and any fear that he may be sent to prison.

By grading the apples as I have just suggested, we are giving sufficient protection to the consumer who buys by the barrel, because when he buys large No. 1's, he gets large No. 1's; if he buys small No. 1's, he gets small No. 1's; and if he buys seconds, he gets seconds; and, therefore, he will be satisfied with what he buys, and will use more apples, and will pay higher prices, because he will have more confidence in the grading of our apples.

But what about the consumer in the cities, towns and villages who buys by the small basket or small measure, or even by the dozen?

Are the apples we have so carefully graded going to reach him in the same grades as we graded them? No. And why?

Because the retailer goes down to the wholesale market, buys your apples branded "Seconds" or "Thirds," takes them to his store, takes the head out of the barrel and sells them to the consumer in small lots as first class Ontario apples, because the Inspection and Sales Act does not cover apples in open packages.

The result is that when the housewife telephones her grocer to send her a small measure of good Ontario apples, he delivers your seconds and thirds, and charges her a good price.

The consumer is displeased, blames the dealer and grower, and uses far less apples than she would if she had been delivered the quality of apples that she had purchased.

Therefore, I claim that the retailer should also be governed by the Inspection and Sales Act, and be compelled to brand with a rubber stamp, every package, open or closed, in the same way the packages are branded in the orchard and in the packing houses. I believe in British fair play, and if the growers and dealers are to be governed by law in regard to the grading of their fruit, and taken to court and fined if they transgress the law, then I say that every person handling apples should be governed by the same law, taken before the same courts of justice and subjected to the same fines as the dealer and grower. This is only fair.

If we bring the retailer under the Inspection and Sales Act, the consumer will then receive the apples under the same grading as they leave the orchard, and the grower will then receive the credit and prices he is justly entitled to for his hard work.

But, you may say, how is the consumer to know anything about the grading of apples?

To this I would reply, let the Government advertise in the papers what firsts, seconds and culls are, and if graded as I have suggested, the language would be

so simple that any man, woman or child could easily understand that firsts are perfect apples, seconds are apples off color and spotted, and that culls were culls, which every person already knows.

The consumers are here and are willing to pay the price; they are in the Canadian West, and are willing to pay the price; they are in England and Scotland, and are willing to pay the price, if we will only give them what they want.

The old idea of compelling the consumer to accept any old thing we see fit to send him is bad business, because he does not have to buy our apples, and he will not pay us the price unless we give him what he wants.

You can easily see the proof of this by looking in the shop windows in Toronto, and see the large quantities of Western apples as compared with the small quantity of Ontario apples, and the quantity of Western apples is increasing every year.

This fact alone proves that our methods of handling this apple business are wrong, and we must adopt new and up-to-date methods which will give the consumer what he wants and is willing to pay for, and what he is justly entitled to.

I beg to thank you and the members of the Ontario Fruit Growers' Association very much indeed for giving me this opportunity of addressing you, as I consider it a great honor. In conclusion, I want to impress upon those present that we are losing our apple trade, and that we must discard the old ideas and adopt new ones, if we are to retain it. And above all things, let us do away for ever with the great uncertainty in the grading of our fruit.

I did not know you were going to have this splendid array of apples here this afternoon, but it is right along my line. You have a box of large apples and one of smaller apples, and I claim those two boxes of apples packed in that way will bring you more money than if you mixed the two sizes together. I have brought with me some apples that I took out of a barrel of No. 1 Spies that a man in the city paid $7 for. There we have the large No. 1; here we have the small apple, perfectly clean, and in my opinion just as good an apple as the other, and it also should be marked No. 1. If you pack those apples together, then the large apple will destroy to a certain extent the value of that small one, because it makes the small apple appear smaller. So I would pack those separately, and then you would have a very nice package of apples.

What have we next? We have this large apple which is off color. If our first apple was No. 1 grade, what should this be? I think we must call that a Second. We have another apple here with color but with some spots, and I would put this one along with the one off color and make a barrel of Seconds.

Now we have another grade here. Here is one which is very small and has two worm holes, and these all came out of a No. 1 barrel. Apples like this are Culls, and they should be marked what they are. I think any man ought to be ashamed of himself to ship such apples to people in a city like this and expect them to consume them, and you men are the ones who are suffering for this. It is coming back on you. Some might object to making two grades of No. 1, but it will make more money for you. If you put No. 1 apples in a No. 1 barrel, and if you put apples off color and those with a few spots in a No. 2 barrel, you will have a good barrel of No. 2's.

Q.—How many spots would you allow?

A.—I would draw the line pretty close.

Q.—How would you define it?

A. Spotted apple as a second.

Q.—Covered with spots?

A.—That is a third.

Somebody will say, "Oh, labor is too high for us to grade our apples in that way; there is too much expense, we cannot do it?" I honestly believe that by this system of putting the apples where they belong, the packers will pack the apples in three-quarters of the time that they do under the present system, and with three-quarters of the expense. Why? The packer has a law hanging over his head, and it is worded so that it would take a Philadelphia lawyer to understand it. He starts sorting apples, and he does not know what to do with an apple like this. He starts a little discussion around the table which will take up ten or fifteen minutes, and then the inspector comes along and the discussion continues, and another ten or fifteen minutes is lost finding out where to put one apple. Under this other system, you know the minute you see an apple where it belongs.

In packing apples in this way, I think we would be giving satisfaction to the consumer who buys by the barrel, because he knows just what is in the barrel.

D. Johnson, Dominion Fruit Commissioner, Ottawa: I am very glad to know the charges are no worse than they are. I was under the impression that possibly Mr. Chapin was going to charge the Fruit Commissioner and the Fruit Inspectors with all kinds of graft, and that we were going to be held up as most awful fellows, but I am pleased that the charges are directed more particularly at the Act rather than at the administration of the Act.

I am free to admit to you that much of what Mr. Chapin has said to you is perfectly correct. What he has stated in regard to No. 2 grade is very largely correct. The Act as it now reads gives very little direction to the packers or consumers as far as No. 2 apples are concerned, and I think I have voiced that sentiment time after time. I have brought that to the attention of the fruit growers and various committees, and asked them to define in some way No. 2 grade, which will give the inspectors some real line of work.

To say the Fruit Marks Act is of no value whatever to the consumer is something I cannot agree with. I am going to give you a case in point. In the State of Maine, they have no Fruit Marks Act, and this year we received in Canada many thousands of barrels of apples packed in the State of Maine, marked No. 1, and all kinds of marks, and when we investigated these apples, we found on the face, they were beauties, but the contents were trash, and we had many of the wholesale men get to work and repack the apples in order that the consumers might be protected.

It is only necessary to go to the State of New York to look over this matter. There are splendid fruit growers and packers over there, and yet a large percentage of the apples packed in the State of New York are very much overfaced. While in Ontario we do have people who will not pack their apples properly, yet some apples will get out like this barrel of apples Mr. Chapin got hold of here. I would not wonder but that he searched the whole city for this barrel of apples.

You must remember that Canada is a big country, and we have only 65 inspectors, owing to the fact that we are under war conditions and we cannot increase our staff as we would like to. The apple districts of Canada are fairly well defined. We know where the apples are produced, and in order to carry out the wishes of this Association, that apple inspection should be almost entirely at the point of shipment, we have instructed our inspector in charge of each section to go up and down the country in order to get to the people, and show them how to pack their apples. As they have found, as in hundreds of thousands of cases, apples not pro-

perly packed, they have gently pointed out to the people that their fruit was not being properly packed, and they stayed with them and showed them how to pack, so that the consumer would be protected. The result has been having thousands and thousands of barrels marked at the shipping point before they have gone out into the market, and in that way we get the best protection we can get.

But the question of open packages is altogether a different thing. We have no control of open packages, and, therefore, all this sort of stuff is put up on you. If there was no inspection or no Fruit Marks Act, your No. 1 and No. 2 would also be trash.

To-day the Western dealers can buy with a reasonable amount of assurance that they are going to get their apples properly packed. In fact the great majority are put through on the condition that they should be packed according to Government standard, and if they are not, then as a rule the shipper or dealer has an opportunity of getting back at the packer. Our opinion has been that if we correct the evil at the shipping point—whether it be peaches, tomatoes, apples, pears or anything else—the consumer is better protected than by any other means. If we were to go into every town and village and city, and all the country districts of this country and tried to make the store keepers honest in the selling of their fruit, it would take a tremendous army of inspectors. We have inspectors who are doing excellent work in protecting the consumers by prosecuting some people. I believe if we can correct the evil at the shipping point, we are doing the greatest service we possibly can.

I would be very glad to have any suggestions. We are willing and anxious to have suggestions at all times, and as soon as the opportunity is offered us, these suggestions will be put into force.

At the commencement of my address, I admitted we have many holes in the Fruit Marks Act. No one knows that better than the inspectors, but until we have legislation in the Parliament of Canada, we cannot go further in protecting the consumers. The law says that the face of the open package shall represent the contents of the package.

Mr. W. F. W. Fisher: Is that not enough? Is not that sufficient for everybody?

Mr. Johnson: Mr. Chapin claims a retailer buys a barrel of No. 3's and he takes the head out and sells them for No. 1's. We cannot stop it.

Mr. Chapin: The consumer is the man who is suffering.

Mr. Johnson: And if you can give us any suggestion as to how we can protect you, we will be glad to do so. The dealers know we have no control over open packages just as well as we do.

Mr. Bunting: Cannot the consumer examine the apples?

Mr. Johnson: With open packages there is an opportunity offered for everyone to examine the fruit before taking it. The Inspection and Sales Act is for the purpose of protecting dealers and men who deal in large quantities.

Mr. Bunting: You made the statement that on the other side it is the practice to over-mark the apples. That cannot take place in this country.

Mr. Johnson: No. I must say for the packers of Canada that as far as over-facing is concerned, they are very honest. It is very seldom we find an over-faced package.

Mr. Bunting: When Mr. Chapin held up these cull apples, there was not a pair of eyes in this audience but recognized them as cull apples, and they could not be put over on us by any dealer or retailer as anything else. I think the average

consumer would have nearly as much intelligence as we have here, and the consumer buying that package would know it was not according to specifications. Of course if it was ordered over the telephone and the maid received it that is another question, and that is the point Mr. Chapin wants to make—that these inferior fruits are delivered at the house without the purchaser knowing exactly what he is getting or having an opportunity of making a protest. If the package is sold in the open market under the personal inspection of the consumer, he can see what he is getting. We know we have some inferior fruit in this country, and there is a trade that will take that class of fruit, and they should not be debarred from taking that fruit if they wish it.

MR. CHAPIN: I think your argument is right along in line with mine. I did not bar any class of fruit. I said it is a shame to have these culls put on the market, but the Government cannot stop any one from selling them. They should be put in a package so that the consumer knows what they are. I do not think a cull has any business in a No. 2 or No. 1 barrel.

I did not mean to infer that the Fruit Marks Act had not done any good, because it has done a great deal of good. The very reason this Act was passed in the first place was because our Canadian apple business had got so bad that we had lost our trade in England, and the Fruit Marks Act was introduced to save the apple industry. It has been of much benefit, but I think we can make it better, and if we take the culls out of the Seconds and out of the Firsts there won't be any trouble.

MR. BRAGG: It was only a few years ago that we saw the first apples from Western Canada in the stores in Toronto. Now you see them in every small town and village in the country, and they are very common in Toronto. If we had attained the high standard which we are trying to reach, these apples would not be in the stores to-day, and while they are coming here, they are displacing our Ontario apples. The people who buy these Western apples are not particular what price they pay, and that should be an incentive to fruit growers to try to improve their orchards and the quality of their apples.

If I have anything to say in regard to No. 1's, 2's, and 3's, I say eliminate the No. 3 entirely, and the people will pay good prices for the No. 1's, and fair prices for the No. 2's.

MR. FISHER: I wish to ask a question of Mr. Johnson. If I understand him right, he said his Department has no control whatever over open packages. That is not my conception of the Act. Here is Inspector Smith who has us all "scared stiff" around Burlington. If he sees an open package that is not full right up to the top or an open package that he considers is not up to specifications, he makes us come to time, and I am wondering if we have been enjoying all the privileges we ought to enjoy.

MR. JOHNSON: I think I ought to qualify that statement. We have no control as far as packing is concerned, but we have as far as facing is concerned. The Act says the face shall be a fair representation of the contents of the package, and unfortunately there seems to be a great tendency for many people to put the big peaches on the top, and we put our inspectors in the Niagara District and similar fruit districts, and the fruit growers work in harmony with the inspectors, and we have fruit going out which reflects great credit upon the fruit growers of Burlington, Niagara, and other districts.

THE CHAIRMAN: I was thinking that we have been saying about ourselves and listening to a great many things that are certainly very caustic. The truth is

what we want to get at. I think I made it this morning in my address, as Mr. Chapin has suggested to you, that there certainly is something absolutely and radically wrong with us, or the system, or something, when such a state of affairs exists as the increasing volume of imported apples. Some will say that this year it is on account of our poor crop. But in 1914 thousands of barrels of our apples hit the ground and stayed there, and the country was full of imported apples. The thing that is radically wrong is that we as growers are persistently blinding ourselves to the fact that there is a market for a lot of better fruit that we can grow. We are too easily satisfied. We grow too much ordinary stuff. If we grew more good fruit, I am perfectly satisfied we could get a very large volume of the trade that is now being supplied by the Western boxed apple. The people who patronize this trade are ready to pay fabulous prices so long as they can get an apple that suits them. Why cannot we get that trade? Here is a sample of apples on the table that have been grown under Mr. Kydd's supervision. I will defy anybody to beat those apples for color or texture or anything else. They will go up against any Western boxed apple for appearance and quality. They were grown in Ontario under ordinary conditions, and why cannot we grow more of them.

I might say that was partly the object in having Mr. Chapin address you on this subject to-day. It was not to poke holes in the Fruit Marks Act. The idea was to bring Mr. Chapin as a representative of the apple trade to speak to us, so that we could get together on common ground to find out where we are losing the trade, and where we are standing in our own light. I am satisfied he succeeded very well in doing that. What he said with reference to the Fruit Marks Act as to the No. 2 apple not being well defined is quite true. I think you will find that just as soon as legislation regarding that can be taken up the No. 2 will be more definitely defined, and No. 3 grade of apple more clearly defined and subject to inspection. This is the last item on our programme this afternoon. It is a very important item for discussion, and if anyone else has anything to say in the matter, let us hear from him now.

A MEMBER: I might just say with regard to the small and large apple being packed together, and my friend Mr. Neil can tell you, that in the West they do not object to the small and large apple being in the same barrel, and they would rather have the two sizes together. Perhaps that would not do if you are catering to a high class city market, but for the Western market, I do not think it is necessary to go to the expense and trouble of separating them, and I do not think they would command any higher price.

With regard to bringing in Western apples. In the city of Brantford I warned the dealers ahead that they were going to be short of apples, and they have been forced, not by any choice of their own, to import apples from British Columbia or elsewhere. At the same time, some of our Ontario growers were getting nearly twice as much in the Old Country in competition with the Western apples.

MR. ALLAN, Grimsby: Regarding the retailer, as Mr. Chaplin stated, what does it matter whether we put up No. 1, 2 or 3 grade if when they get to the retailer, he sells them all as No. 1. I call that man a crook, and the law should get after him and punish him. The Fruit Marks Act has no hold on that man. I hope there are very few of those men in Toronto, and I believe there are not. I think the Fruit Marks Act is doing its work well. The inspectors are busier every year. Mr. Johnson says when normal conditions are restored again he will be able to put on a whole forest of inspectors, and the difficulties will be cut down to a minimum.

MR. PRITCHARD: I think the difficulty is that there is no one looking after our local trade. It is a well known fact—at least that is the way I see it—that the apples of this country largely go into the hands of the speculator, and he puts them into store houses and repacks them. He is looking after the foreign trade, or where he can get the most money. It has not occurred to him that he can get the most money in our local markets. The speculator gets the best apples, and we have nothing but culls to give our own people.

MR. CAREY: I wish to say a few words about the No. 3. I attended a meeting in Nova Scotia a few weeks ago, and a committee was appointed to endeavour to define the No. 3 apple. You all know the difficulty of defining the No. 3. We spent two days trying to define the No. 2. We took up the Act, and I found something in it that helped us out. The definition of a cull reads something like this: "A cull is an apple either very small for the variety or with the skin broken so that the tissue beneath shows, or so affected with fungus, worm holes and other defects which render it unmarketable." At the beginning of each grade, in the first paragraph it says, "It shall include no culls," and then it defines the No. 1 and the No. 2. After discussing the matter of the No. 3 for a few hours, we came to the conclusion that to put at the beginning "Shall include no culls" was the only feasible thing to do; and I want to submit it to this meeting, as Mr. Johnson said I might, and ask you what you think of that definition. It certainly would keep out bruised apples, broken apples, scabby apples or very small apples, and that is as good a definition as we could arrive at for No. 3.

All inspectors will back me up in saying we are all very careful how we deal with the No. 2 grade when it comes to valuation. Last year at this Convention, we decided on a grade called "Domestic," and included such apples as Mr. Chapin showed here with a little off color or having a few spots. But that has not gone through Parliament yet.

PROF. CROW: Was anybody ever prosecuted under that phrase "Shall include no culls" for the No. 1 or No. 2?

MR. CAREY: I do not think that question ever came up in a Court. The other defects were so apparent that it overshadowed anything of that kind.

PROF. CROW: It might as well not be in the book?

MR. CAREY: In the No. 3 apples the point would be raised at once, because three-quarters of the apples now put up under No. 3 are culls, and I think the question would be raised in that case.

MR. PRITCHARD: In regard to the No. 3 apple I believe in having free trade in regard to that matter. A person is not obliged to buy an apple unless he wants it.

As to the No. 1 and No. 2, I think the suggestions made by Mr. Johnson last year to make No. 2 a better grade, and possibly Mr. Chapin's idea in dividing the No. 1 into two sizes, are very worthy of consideration, especially for the local market. But the lower grades of apples ought to be left in the hands of the people who buy them, and allow them to stand on their own merit. If you sell a man a lot of culls for No. 3 apples, you cannot do it the second time. You may keep on selling to other people, but you will lose your name. Let the man who grows inferior apples sell them to the best advantage he can, and let the buyer buy them to the best advantage he can. Everybody knows a good apple from a bad apple, and they are not compelled to buy what they do not want. I think the less you try to govern people in a matter of this kind, the better off we will be.

A MEMBER: There is a matter in connection with this discussion that has not yet been touched on. In a season like the past, a large number of dealers who had voluntarily eliminated themselves from the market because they could not pack No. 1 and No. 2 grade have come back, and have bought a large number of apples and graded them as "Orchard Pack No. 3." The buyer has a right to expect something better even though it is marked No. 3, and No. 3 ought to carry something better than orchard apples.

There is another fact that I have noticed. Some man with a small orchard, unsprayed and more or less neglected, through a friend, gets an order for a few barrels of apples. He does not know anything about packing, and he puts everything in it, and he ships it out immediately, and it goes straight to the man who buys it. It is not subject to inspection on account of the circumstances under which it is shipped, although the law compels a barrel of apples to be marked with the name of the producer. I know of several cases where small orders have gone to men engaged in a small retail trade, and the Fruit Marks Act has been overlooked by them in every case of that kind.

MR. CHAPIN: Just to explain how I got these apples. That was only one barrel out of twelve which were just the same as that. They were in a wholesale house on West Market Street, and the wholesaler sold five barrels at $7 apiece and they were all brought back to him, and the packer had been in the business for twenty-five years. The reason I was called in was because I happen to handle that brand of apples for export. There were twelve barrels. Furthermore, I went down into the tail end of this barrel to get two clean apples, and I had to go to a barrel of Nova Scotia Spies to get those two No. 1 apples that I showed you. The inspectors were called in, and they got the men who packed the apples, and they were marked down to No. 2.

MR. CARPENTER: I have listened with a great deal of interest to this discussion, and I think it is time you took some action on the Fruit Marks Act. It would be a good idea for a committee to be appointed to act in conjunction with Mr. Johnson in going into this matter, and have the law changed so that it would govern all cases.

THE CHAIRMAN: At the last Convention, I believe there was a committee appointed to confer with the Fruit Commissioner relative to the proposed changes in grading apples. The matter of green fruit was discussed, and did not reach a climax. Of course what we have been discussing this afternoon was discussed last year, and I believe what the Convention carried last year in the form of a resolution about covers what we have been discussing this afternoon.

MR. CARPENTER: Has that committee reported at all?

THE CHAIRMAN: The committee has not been called into action, because on account of the war no action could be taken.

MR. HODGETTS: Ontario has been getting hit pretty hard this afternoon, and I do not think it is altogether square. Of course we know the conditions in the Province are the worst we have ever seen. I do not think anybody can remember when the scab has been so bad, and the orchards have had to be neglected on account of weather conditions. Consequently we have a lot of poor apples. Yet there have been a great many good apples go out of the Province this year. There are men like Mr. Fisher, Dr. Grant, Mr. Gibson, and many others, who are growing thousands and thousands of barrels of splendid apples, that have gone out to satisfied customers. The poor apples are here, and they will always be with us, like the poor man. We shipped 23,000 boxes overseas this year that were bought

from various men in the Province, and these also were very satisfactory. I know that a great deal of fruit was sent West that was quite satisfactory to the grain growers out there. While there may be cars here and there that were defective, on the whole, considering the difficulties that the Ontario fruit growers were up against this year, Ontario fruit was all right.

Toronto gets the worst quality of apples of any market on the continent. I do not know exactly why that should be. One reason undoubtedly is that the Fruit Growers' Associations believe that they can make more money supplying the export markets than they can by shipping to Toronto. I suppose they must have proved that by the prices they have got in the past. Undoubtedly our best fruit has been going to the West and to England and Scotland, but at the same time Toronto has been getting some good apples. Anyone who has seen the orchards belonging to the Watsons at Port Credit, who bring large quantities of apples into the city, will back me up in this statement; but a lot of poor apples come into Toronto, I am told, because the dealers have been willing to pay the low prices, and bring that class of fruit in, knowing there is a big demand for it.

MR. FLEMING: In 1913 there was some $800,000 worth of fruit, that is including duty, imported from the States; in 1914, some $1,200,000 worth of apples imported from the States. Those are the most recent figures I have got. The competition used to be all from the States, but now it is coming from British Columbia, and I think that is a good sign. They are very wide awake in British Columbia.

DUSTING AS A SUBSTITUTE FOR SPRAYING: HISTORY AND PROGRESS.

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Dusting is probably the oldest method of applying fungicides and insecticides. Long before Bordeaux was discovered, dry sulphur was dusted on grapes, roses and other plants to control the mildew, while various poisons and deterrents were likewise applied against insect pests. The apparatus for applying these was very primitive: the hand, a thin cheesecloth bag, or a tin can with holes in the lid. Primitive dusters, modified forms of hand bellows, were also in use.

With the discovery of Bordeaux mixture, and the resulting general adoption of the copper sprays, sulphur as a fungicide all but disappeared from the materia medica of the orchardist. The application of fungicides or insecticides in a dry form received but little attention from 1880 until the beginning of the present century about 1902.

The history of dusting as a substitute for spraying in the control of apple diseases and insect pests is not an ancient or extensive one. There have been two dusting periods during the history of apple disease control in North America. The first extended roughly from about 1900 to 1908; and the second, the present one, began in 1911.

THE DRY BORDEAUX AND PARIS GREEN PERIOD.

The first movement to substitute dust for liquids in the apple orchard was initiated in the hilly apple regions of Missouri, where the topography of the land and the scarcity of water made spraying difficult if not impossible. This move-

ment arose and declined during the last decade in which copper in the form of Bordeaux retained its dominating position as the fungicide, and Paris Green, a similar place as the insecticide for the apple orchard. Naturally the dust mixtures proposed and tested were of the same nature. Apple growers in the Ozarks appear to have been the first to attempt the use of dry Bordeaux and Paris green. Experimental work was undertaken largely by the entomologists and horticulturists of several state experiment stations about 1902. The first report on such work of any importance appears to have been that of Craig from the Cornell Station in 1904, to be found in Cornell Bulletin 216, pp. 111-117. Similar experiments were reported during the years 1905 to 1908 inclusive, from Delaware, Michigan, Illinois, Washington, Arkansas, Missouri and Oregon. The most extensive of these tests appear to have been those made in Illinois, as the result of which it was concluded "that dust-spray is absolutely ineffective as a preventive of injury from prevailing orchard fungi, and that it is considerably less efficient as an insect remedy than is the liquid method of applying arsenates." In spite of the fact that the experiments in some of the other states, notably in Delaware, Michigan and New York gave promising results, especially in the control of the insects, the results in Illinois were apparently so decisive that with the close of 1908, dusting, as a means of controlling apple pests and diseases, was entirely abandoned by experiment stations. Some growers in the different apple growing sections, however, continued to employ dust, but they were few and attracted little attention. In closing our discussion of this first unsuccessful attempt to develop dusting several important facts should be emphasized: (1) that it was made with a fungicide and insecticide poorly adapted for application in dry form; (2) that the machinery used was relatively primitive and not well adapted for orchard work; and (3) that since that time much has been added to our knowledge and experience in the control of apple fungi and insects.

The Dry Sulphur and Arsenate of Lead Period.

The year 1907 saw the discovery by Cordley, in Oregon, of the possibilities of lime-sulphur solution as a substitute for Bordeaux in the control of apple scab. So successful were his experiments again in 1908 as to attract the attention of apple growers throughout the United States and Canada. Stimulated by the success of Cordley, the Cornell Station began in 1909 an extensive investigation of the merits of lime-sulphur as a summer spray. The success of these experiments was so convincing to New York State growers that within three years an almost complete change was made from Bordeaux to lime-sulphur. In the State of New York, our experiments during 1909-1911 with lime-sulphur were so successful that not only in New York, but throughout the United States, Canada, and, in fact, the apple growing sections of the world, lime-sulphur and arsenate of lead have largely replaced Bordeaux and Paris green for the spraying of apples. And who will deny the progress in disease and insect control which this change represents? Prior to 1900, copper sulphate and Paris green ruled; to-day it is sulphur and arsenate of lead. To-day these substances are applied wet; spraying is the almost universal method of applying these to the apple orchard.

The substitution of dry sulphur and dry arsenate of lead for these substances in solution for apple orchard treatment was undertaken by Blodgett of the Cornell Station in 1911. Another step in the progress of disease control in our apple orchards was thus initiated.

The decision to again raise the question of dusting as a substitute for spray-

ing in the apple orchard was determined by: (1) a demand for a more rapid method in order that applications may be more timely; (2) the fact that it is the sulphur finally left from the lime-sulphur on fruit and foliage that is the effective fungicidal agent; and (3) the success attained in the control of hop mildew in the hop sections of New York by dusting during the seasons of 1910 and 1911.

The necessity for timeliness in making applications of fungicides has become more evident with each passing season. We pathologists have preached it with increasing confidence and vehemence; you growers have more and more recognized and admitted it. With seldom more than one to four days in which a given application may profitably be made, a method more rapid than spraying is required. With soft ground in the orchards at the time when the early applications are called for, an outfit that eliminates heavy machinery and tons of water is imperative. Dusting would make timeliness of application possible.

Investigation had clearly shown that it is the finely divided sulphur particles left on the leaves and fruit from the dried lime-sulphur that destroys the scab fungus spores. The sulphur itself is the fungicidal agent. Since this is true, there can be no particular virtue in putting it on in water if it can be applied dry.

The success with which dusting with sulphur for the control of powdery mildew in grapes in Europe and on the Pacific Coast; for asparagus rust in California and finally for hop mildew, both in England and in the State of New York, seemed to warrant the conclusion that it could be successfully dusted on apple trees.

The path of progress lay clear before us. Every fundamental requisite for success was at hand. Here was an effective dry fungicide; a tested dry insecticide to mix with it; a fairly efficient apparatus for applying the mixture; an investigator trained and experienced in the methods to be employed; and most hopeful of all, the confident interest and co-operation of the apple growers of the State.

Under such propitious circumstances, the first results of importance were obtained during the season of 1912. The work was continued and greatly extended during the seasons of 1913, 1914, 1915, and 1916. Let us consider for a moment the following summarized figures for the experiments conducted during these years:

TABLE 1. SUMMARY OF RESULTS OF DUSTING IN NEW YORK FOR THE SEASONS 1912 TO 1916, INCLUSIVE

Yr.	Name	Variety	Place	Untreated			Sprayed			Dusted			Perfect Apples favor of		Scab Control favor of		Worm Control favor of	
				Perfect	Scab	Codling Moth	Perfect	Scab	Codling Moth	Perfect	Scab	Codling Moth	Spray	Dust	Spray	Dust	Spray	Dust
1912	Kinne		Hartwick Seminary	3.8	9.3	50.9	73.6	0.7	11.4	86.2	0.5	6.0		12.6		0.2		5.4
1913	Catchpole		North Rose	7.5	79.8	12.3	61.0	21.0	1.4	63.7	33.5	0.4		2.7	12.5			1.0
"	Lawson	King	Owego	10.9	21.9	20.3	42.8	24.9	6.7	45.7	34.9	4.2		2.9	10.0			2.5
"	"	Spy	"	9.2	50.2	46.0	22.1	39.8	41.9	38.1	25.8	27.3		16.0		14.0		14.6
1914	Glidden	Baldwin	Holley	6.4	83.0	1.1	63.2	15.7	0.1	70.6	14.1	0.2		7.4		1.6	0.1	
"	Catchpole	Ben Davis	North Rose	9.6	81.4	0.1	63.7	20.1	0.0	30.3	48.3	0.1						
"	Friedah	Ben Davis	Owego	0.1	96.4	2.2	51.4	34.2	0.0	26.5	67.3	0.1						
1915	Rogers	M. Blush	Williamson	60.8	21.7	0.8	82.6	0.9	0.1	85.3	1.3	0.0		2.7	0.4			0.1
"	Jungbluth	T. Ounce	Spencerport	48.8	2.8	16.1	53.0	0.1	7.8	57.5	0.5	7.1		4.5	0.4			0.7
"	Glidden	Greening	Holley	7.6	77.7	7.6	75.9	0.2	1.6	67.9	6.7	0.9	8.0		6.5			0.7
"	"	Baldwin	"	49.7	28.3	4.2	87.4	1.5	0.6	82.4	4.7	1.6	5.0		3.2		1.0	
"	McClew	Greening	Newfane	36.8	13.4	15.8	77.0	0.4	2.6	84.3	1.5	1.5		7.3	1.1			1.1
"	"	Baldwin	"	29.0	16.6	15.6	73.8	1.5	3.2	66.9	2.5	8.3	6.9		1.0		5.1	
														3.3	1.7			1.9
1916	Anderson	Baldwin	Hilton	8.1	91.0	6.1	33.1	65.7	2.2	29.7	69.5	1.4	3.4		3.8			.8
"	Smith	Baldwin	"	6.3	89.8	17.9	33.1	60.4	9.8	18.6	75.8	11.9	14.5		15.4		2.1	
"	Curtis	Baldwin	"	25.7	66.6	19.4	40.6	44.0	18.4	14.9	79.7	27.0	25.7		35.7		8.6	
"	Tenney	Baldwin	"	4.1	95.2	9.1	53.1	44.3	4.9	32.3	65.0	5.6	20.8		20.7		0.7	
"	Collamer	Baldwin	Collamers	10.1	88.9	3.0	68.6	31.7	1.8	33.0	65.0	2.8	35.6		33.3		1.	
"	Smith	T. Ounce	Hilton	5.7	91.0	24.6	31.0	61.1	17.7	17.0	76.9	19.4	14.0		15.8		1.7	
"	Lee	T. Ounce	"	3.0	96.6	55.3	25.0	55.8	24.4	32.5	59.8	25.8		7.5		6.0	1.4	
"	Curtis	Greening	"	2.5	97.3	6.2	45.3	53.1	4.0	11.1	87.7	8.5	34.2		34.6		4.5	
"	Case	Baldwin	Sodus		(90)		37.6	61.9	1.6	46.4	53.2	.5		8.8		8.7		1.1
"	Lumb	Greening	Barker	2.2	96.5	24.0	66.9	25.2	10.0	36.2	60.7	3.1	30.7		35.5			6.9
"	"	Baldwin	"		(90)		78.9	19.4	1.9	64.9	33.5	1.7	14.0		14.1			.2
"	Cothran	Baldwin	Youngstown	11.7	87.8	3.2	65.4	34.0	.8	56.1	42.4	1.9	9.3		8.4		1.1	
													15.6		16.9		1.0	

It is to be observed that these thirteen separate experiments, covering the four years, were carefully planned to make a severe test of the efficiency of applying sulphur and arsenate of lead dry as compared with applying them wet. They were planned and carried out under the immediate control of experienced investigators—Blodgett during 1912 and 1913, Reddick and Crosby during 1914 and 1915. There were naturally various obstacles which interfered with ideal work in some cases. For example, the results obtained in the Catchpole and Friedah orchards in 1914 vary so strikingly from the results in all the other experiments during the four years as to indicate some reasonable explanations therefor. An examination of the detailed records of these experiments in Cornell Bulletin 354 affords such explanations. We state them briefly. Scab was practically the only pest to be controlled in either orchard, codling moth being almost wanting. The failure to get scab control with dust in the Catchpole orchard is attributed: (1) to very high winds at the time of the second application, which prevented as thorough application of the dust as was possible with the spraying; (2) the heavy drenching rain on the afternoon of June 19, during the forenoon of which the third application had been made; the spray mixtures stuck better than the dust which had not had a light rain or dew to help fix it on the fruit and foliage. Had another application of the dust been made directly following the downpour of June 19, the infections which took place during the very favorable infection period of June 21-24 inclusive would doubtless have been largely prevented. In short, very exceptional weather conditions were here largely responsible for the failures. The failure to get control of the scab with the dust in the Friedah orchard is to be attributed to the following facts. In making the third application June 20, directly after the infection period of the night of June 19, the spray was applied early in the morning. The dust was not put on until after five o'clock in the evening. This was eighteen hours after the rain set in, giving the scab fungus time to infect the fruit before the dust was applied.

Leaving out of consideration, then, the Catchpole and Friedah experiments of 1914, since the results there obtained may not justly be compared with the other experiments, let us consider the averages of the results obtained in the remaining eleven experiments. First as regards perfect apples: there was an average of 3.3 per cent. more perfect apples on the dusted than on the sprayed trees. Second as regards scab control; there was but 1.7 per cent. more scabby apples on the dusted than the sprayed trees. Third as to worm control: there was nearly 2 per cent. less wormy apples on the dusted than on sprayed trees.

What do these exceedingly small average differences in favor of one method or the other show? They show that under average conditions with little experience and relatively unperfected equipment just as good results were obtained with dusting as with spraying. In fact, these results are decidedly favorable to dusting for they indicate, that with increased experience and improved machinery, better results may be expected on the average from dusting than from spraying.

Dusting in New York Apple Orchards in 1916.

With four seasons of such uniformly favorable results behind us, it was not deemed necessary to continue further carefully planned and controlled experiments in dusting for the control of scab and worms in the apple orchard. It was felt that further progress in perfecting dusting for this purpose might safely

be left to the growers and the commercial manufacturers of dust and dusting machinery. It was felt that any further efforts on our part lay along the lines of extension work in the form of co-operative demonstrations with growers. To this end there were conducted during the past season (1916) a number of comparative dusting and spraying demonstrations in apple orchards in different apple growing sections of the State. Due to the energetic co-operation of County Agents Toan and Peet, these experiments were most numerous in Monroe and Niagara Counties.

If the statement for 1916 represented the results of twelve experiments carried out by a trained experimenter and covering a period of several successive years, one might be justified in concluding that dusting is a failure. We must consider, however, that they represent the results of co-operative demonstrations for a single season and that, the most unfavorable for scab control in twenty years.

Before discussing the dusting situation, it will be well to consider the prevailing opinion that spraying during the season of 1916 was generally ineffective and unsatisfactory. The more evident reasons for this conclusion may be stated concisely: (1) weather conditions during the spring were exceptionally favorable to the scab fungus; probably not in twenty years have growers experienced a spring so favorable to scab as the past one; (2) the cold rainy season made spraying exceptionally difficult; the ground was often too soft for heavy tanks and machinery and the rains were often so frequent and extended as to preclude applications at the proper time; (3) the continued cold, wet weather in May delayed the normally rapid development of the leaves and blossom buds; they were thus not only longer exposed to inoculation but were held in an especially susceptible condition.

Under such conditions, it was often impossible to make timely applications of spray mixtures. When they were made, the work was rushed in order to cover as many trees as possible with the result that the spraying was much less thoroughly done. It was a test season; a season in which only the most experienced, best equipped and most fortunate grower could be expected to succeed entirely. The results bear out this expectation when such well known and successful apple growers as those whose names appear in tabulated results succeed in getting an average of scarcely 40 per cent. more perfect apples on their sprayed trees than were to be found on their unsprayed trees.

Turning now to the results with dusting during the season just past, let us examine the data at hand.

Co-operative Demonstrations. An examination of the results tabulated for 1916 shows an average of 15.6 per cent. more perfect apples on sprayed than on dusted trees; an average of 16.9 per cent. less scabby fruit on sprayed than on dusted trees and 1 per cent. less wormy apples on trees sprayed than on those dusted. This minute difference of 1 per cent. in the control of codling moth may be dismissed with the evident conclusion that one method was quite as effective as the other. The difference of 15 and 16 per cent. in favor of spraying for perfect fruit and scab control represent in the writer's opinion the price of inexperience, coarse sulphur, and imperfect machinery in a season exceptionally favorable to scab. This opinion is fully warranted in view of the fact that in the four previous seasons of average weather conditions working under similar handicaps as to experience and machinery, equally as good results were obtained by dusting as by spraying. We venture to predict that in coming seasons, with increasing experience, improved dusters and finer sulphur, better results with dusting will be secured than with spraying.

Opinions of Growers Who Dusted.

The opinion of a single grower or experimenter for that matter is seldom or never to be trusted; never to be put over against proved facts and fair figures. On the other hand, the concensus of opinion of a large number of growers who have tested a new method is always worth consideration, and not to be rejected without most careful consideration. We collected the written expressions of many growers who in 1916 dusted more or less extensively. The statement of a grower that he expects to dust again next year is sufficient evidence that he at least believes in the possibilities of the method, for no fruit grower would gamble his time and money on a proposition which he believed to be a failure. On this basis, then, we have divided the growers, whose opinions on this matter we have obtained, into three groups: those who say they will dust next year; those who are doubtful; and those who say they do not expect to dust. Seventy-five per cent. of those whose opinion we have will dust next year. They believe to a greater or less extent in dusting, and that in a year when most of them fell down with it. They are wise enough to seek the explanation of their failure elsewhere than in the method which the four preceding years has shown to be equally effective with spraying.

Relative Cost.

The question of relative cost of the two methods is a most important factor for the apple grower. In demonstrations conducted in Monroe County, New York, in 1916, the cost of dusting averaged 77 cents per tree for the season as compared with 43 cents per tree for spraying. This appears to challenge the statement made in a previous bulletin* that "it now appears that an orchard may be protected by dusting at the same cost per tree as spraying, or at less cost." It must be remembered that about 95 per cent. of the cost of dusting is cost of materials, so that any increase in price or amount of materials is at once reflected in the cost of dusting.

Two factors appear to have been the cause of the higher cost of dusting in Monroe County in 1916. One of these, the coarseness of the sulphur has been previously referred to. This tends not only to lessen the effectiveness of dusting but also to raise the amount used. The operators, who were accustomed to using finer sulphur, found it very difficult to reduce the amount applied and still be certain that the trees were well covered. This was because the coarser sulphur does not produce so dense a cloud of dust when the same amount is used as does the finer sulphur. There was always, then, in these tests a tendency to raise the amounts of sulphur and thus raise the cost.

The materials cost more per pound than reported in previous experimental work, and also more than reported by large commercial growers in Orleans County who mixed their own materials.

If suitable allowances were made for these two factors, it appears quite certain, that the difference in cost would have been slight. This experience rather emphasizes the necessity for using care in the purchasing and using of dusting materials. A comparison of the price of sulphur and lead arsenate should be made with the cost of the prepared mixture. It has been shown by the experience in Orleans County that the cost of mixing is very slight, especially

*New York Cornell Bulletin 354, page 92.

where a number of men buy a machine together. Equal or greater emphasis should be placed on the importance of securing finely ground sulphur.

Improvements in the dusting machinery, which will enable the operator to more effectively control the amount delivered and the direction of delivery, will tend to a marked reduction in the cost of material. It is now generally considered that much of the material is wasted.

Conclusions.

We believe it may be said that in general those who sprayed apple orchards in 1916 were less successful than in previous seasons. There were some striking exceptions which only indicate where responsibility for failure is in general to be placed.

Available data and opinion show that in general less satisfactory results were obtained by dusting than by spraying, but that the difference was actually small (on the average 15 to 16 per cent. in favor of spraying). That this failure to get as good results with dusting as with spraying is not to be attributed to the method seems certain in the face of the experimental data of the four previous seasons. To take any other position on this point is to question the personal integrity or scientific ability of the investigators. Certainly no intelligent grower or experimenter is prepared to take such an attitude on the basis of the results of a single season and under such conditions as we have experienced in 1916.

Wherein then lies the explanation of the general failure to get as good results with dusting as with spraying. Were we thoroughly familiar with all the details in each case, no doubt specific and convincing reasons could be presented. That they would not be the same in all cases is evident. As the speaker sees it, the explanation lies primarily along the following lines: (1) relative inexperience in dusting as compared with spraying; spraying was even under the trying conditions more thoroughly done than dusting; (2) coarseness of the sulphur generally used. The efficiency of sulphur as a fungicide depends to a very large degree upon the fineness of the particles. The sulphur generally used in these experiments was not as finely ground as it should have been, at least in the earlier applications. This is shown by tests made in our laboratories. It was certainly not as fine as that used in the experiments of 1912 to 1915. (3) General failure to appreciate the greatest advantage which dusting has over spraying, namely, that of the possibility of making timely applications. More frequent applications of the dust could and should have been made at critical times than were possible with spraying. (4) The dusting machinery is much less perfected than is spraying machinery. This is especially true of the delivery and distributing parts of the apparatus. Compare the large rigid delivery tube of the duster and its unmodified mouth with the flexible hose, light rod and highly perfected modern nozzle of the sprayer.

Not one of these factors offers an insurmountable or even serious obstacle to the substitution of dusting for spraying. It is only necessary: (1) that growers continue to dust and thereby gain the requisite experience; (2) that sulphur be ground finer and that growers insist on getting the finest to be had; (3) that timeliness of application be studied, emphasized and practised; and (4) that the manufacturers of dusters improve their machines, especially the feed control and distributing tube.

Every grower who sprayed last season, whether profitably or not, will go forth with confidence to spray his trees next season (if he does not dust). Every

grower who dusted last season may likewise go forth with his duster in equal confidence that with increased experience and improved machinery, he may expect to get on the average as profitable results with dusting as with spraying. The results of the experimental work of the four seasons previous to 1916; the opinions of the growers of New York State who dusted in 1916; and the generally favorable results from other states and countries where dusting was tried out the past season, fully justify this optimism. Here are the facts and opinions. It is for you, the intelligent grower, to decide on the evidence at hand what you individually will do. It is not for me to advise or recommend.

Q.—Do you use that dust for scale?

A.—Our entomologists are experimenting with that at the present time, but I cannot give you any definite information. I know in a general way they are hopeful that it will be successful.

Q.—Have you used the sulphur dusting for brown rot on peaches?

A.—We have not, but others have had very good results from dusting.

Prof. Caesar: Do you know anything about the effect of the dust on potatoes?

A.—I do not happen to know of any experiments that have been conducted, but I see no reason why satisfactory results could not be obtained. There are some small dusters on the market now that can be used for that purpose.

Q.—What is the price of this machine you use for dusting in an orchard?

A.—I do not sell the machine, but if you ask some of the men who are selling them they will give you the figures.

Mr. Hart: I cannot give you any figures except from the United States. The price there for the larger orchard machine is $125—that is, for the machine without the engine. We sell them without the engines because the old sprayer machine engine is strong enough for the dusting machine.

Q.—What power engine does it require?

A.—It takes two and a half horse power to operate the machine at the maximum capacity, but we use a three horse power engine to take care of the overload.

Q.—Must you have an air-cooled engine?

A.—We simply use that because we happen to be handling that engine in our territory.

Q.—Have you a duster that can be used in ordinary town gardens?

A.—Yes, we have a hand-pump that is sold for $3.

Prof. Wietzel: I use one of them in my garden, but he cannot sell me another one. I have seen most of the hand dusters that are on the market. I have an opinion that they ought to make us a good deal better duster than they have at the present time. It is a very tiresome job to use them.

Q.—Has anybody done anything in the way of dusting with tobacco dust?

A.—Yes, our entomologists are working now on tobacco dust for San José Scale and also for the Aphis and other things. It does not make any difference whether they have results or not, if you insist on them continuing they will get you results.

Q.—Do you recommend 10 per cent. arsenate of lead instead of 15 per cent.?

A.—No, I do not recommend anything at all. We have used 15 per cent. and 85 per cent., but we do not know that that is the best combination. In our nursery work we use 10 per cent. and 80 per cent. If I were going to dust with what little knowledge I have about the insect end of it, I would use only ten

pounds of the arsenate of lead, particularly if it was expensive. I would take a chance for one year, and then if I did not kill all the worms, I would say I had not a sufficient quantity of lead. It is up to you to use enough to kill them.

Q.—Have any injuries ever resulted from the experiments you have conducted?

A.—Not in our experiments, but peach-foliage has been injured where the sulphur has been converted into sulphuric acid, and I think there has been some burning of the leaves. The chances are that this foliage was badly scabbed, and that would be burned by almost anything you put on it. There are dusting materials on the market that might cause injury. There is a lime sulphur dust that some concerns are putting on the market that might burn, but I do not know positively as to that. Then there is soluble sulphur; I am speaking of sulphur and arsenate of lead.

Q.—What about it being washed off by the rain?

A.—Dr. Blodgett carried on rather extensive tests as to the sticking value of dust. If the dust sets before the rain it will stick just as well as the spray. If the dust has lain on the trees overnight, the moist atmosphere of the night will fix it, and it will stick, but if you dust and the next hour it rains, it will be washed off. If you will remember how hard it is to wash off road dust from the leaves on your trees after it has once set on them, you will understand that dust will stick. When the dust sets on foliage, it is very hard to wash it off.

Q.—Is it necessary to spray both sides of the tree with the dust?

A.—You will have to dust both sides of the tree if you want a good job. If you can do a good job of spraying from one side all right, but I prefer to dust from both sides.

Q.—Is it better to dust in the morning when there is less wind?

A.—It is better to spray when there is less wind. On the other hand, I would not put off dusting because there was a nice breeze going. If you put on the dust early in the morning or late in the evening when the air is cool or when there is a slight breeze, I think it is better. If a heavy wind is blowing, it will affect the dust the same as it will the spraying.

Q.—Do you think we could have produced clean fruit in a season like last year by dusting?

A.—Here is the answer to the question: It is the sulphur that does the business, and the arsenate of lead whether you put it on with water or air. You can put it on a good deal more quickly dry than wet. It is my opinion that when you know the dust game you will be able, in a season like last season, to get much better results with dust than by spraying, because you can do it more nearly at the right time. The fact that you did not succeed last year is not conclusive evidence. You did not take into consideration the fact that you can put the dust on several times in quick succession. You dusted once and let it go.

Q.—The two years with the experiments were exactly the same; you did not give the percentage of apple scab in the orchard?

A.—You will find that in this bulletin that I spoke of.

Q.—How many sprays did you put on before the buds show pink?

A.—That all depends on the season. You might put on three and you might put on one, and if you were a good gambler, you might not put on any and get away with it. If there are frequent rains you would have to put on more. Ordinarily in the State of New York, we put on one spraying before the blossoms are over. Some growers put on two. It all depends on the weather.

The day you are going to dust depends first upon the development of the buds, and second, the weather, and you cannot ignore either one or the other. The number of applications in any season will depend upon the season just the same as in spraying.

Q.—It seems very evident that you yourself are absolutely convinced that dusting will control the apple scab?

A.—You can control it with dusting just as efficiently as you can with spraying.

Q.—There are many here who have had 90 per cent. control, and we may assume from your evidence that any man who does efficient work with the dust would have the same results?

A.—I should assume so. My opinion is based on the evidence; that is the only way in which we can judge, and the evidence shows plainly that for four years in which experimental dusting was done that was as effective as the spray It is my opinion that a man who is a successful sprayer with a liquid spray, with a couple of years' experience would be just as effective with the dusting.

DUSTING FOR TENDER FRUITS AND APPLES.

L. Caesar, Provincial Entomologist, O.A.C., Guelph.

The experiments with dusting were carried out on apples, plums, sweet cherries, peaches and grapes.

Dusting Apples.

The orchard chosen for the experiment was situated at the base of the so-called mountain near Grimsby. It consisted of 162 large trees. Of these, 92 in a solid block were selected for dusting, 51 for spraying with the liquid lime-sulphur and arsenate of lead, and the remainder for spraying with soluble sulphur and calcium arsenate. As the buds were ready to burst or in some cases bursting, the whole orchard was sprayed heavily with lime-sulphur to control the San José Scale, which was somewhat abundant on most of the trees. The dusted part received only two treatments with the dust over and above this first dormant spray with the liquid lime-sulphur. The first dusting was just as the blossoms were ready to burst. Every tree was in nearly ideal condition for treatment. The second was very soon after the blossoms had fallen. The mixture used was 85 per cent. finely ground sulphur and 15 per cent. arsenate of lead. Precautions were taken to see that each tree was thoroughly done. It was found after some trials that three pounds were sufficient to treat each tree if properly applied.

The portion sprayed with the liquid received just as careful treatment and at the same stage of the foliage and blossom as the dusted area, so that there might be a fair comparison.

Results.

1. The *foliage* on the dusted area was decidedly superior to that on the area sprayed with the liquid spray, the leaves being almost perfect, whereas those on the part sprayed with the lime-sulphur were more or less crumpled, and while very little injured, they did not look nearly so beautiful and uniform.

The soluble sulphur and calcium arsenate burned the foliage severely and showed itself not by any means a safe spray mixture.

2. The Codling Moth and Lesser Apple Worm, the two chief insect pests, which are in fact so closely allied that they are easily mistaken for each other, were well controlled on all plots treated whether dusted or sprayed with liquid. There was a very little difference in the degree of control on these plots. Possibly the lime-sulphur and arsenate of lead gave slightly better results than the dust. In no part of the orchard was there more than an average of 7 per cent. or 8 per cent. of wormy apples. This for the Niagara district, where the Codling Moth is normally very abundant, I consider very satisfactory. The check trees and unsprayed orchards in the neighborhood showed from 50 per cent. to 60 per cent. of wormy fruit.

3. On Apple Scab the results were that the liquid sprayed part had 99 per cent. and upwards of fruit free from scab, while the dusted area had 97 per cent as near as we could judge. All the fruit was not counted, but a careful estimate was made of every tree and a considerable number of fruits from each tree were counted.

The varieties in the dusted area were Baldwin, Greening, Spy, 20-ounce Pippin, Yellow Harvest, Red Astrachan and Gravenstein. Yellow Harvest is well known to be very subject to scab, but showed only 3.4 per cent. from actual count of 1,500 apples at picking time. The check trees showed an average of from 30 per cent. to 70 per cent. scabby fruit, the average being around 50 per cent.

Plums.

Fifty-five Lombard plums in the orchard of J. W. Smith, Winona, were treated with the dust, and 40 of the same variety in the same row in a similar situation were left untreated. The plums received three applications with the dust in addition to having had the early dormant spray with lime-sulphur. The first of these was on June 12th, the second on June 26th and the third on July 27th.

Results.—There were very few insects attacking the plums even on the check plot, so that insects need not be considered. The Brown Rot on the check trees was not specially prevalent, and yet it injured a considerable number of the fruit. The trees were small, each of them being capable of bearing only about five or six baskets of fruit. An average of four to five clusters of rotted plums per tree were found on the checks the last time I was able to examine them which was shortly before picking. On the dusted area only two clusters in all of rotten fruits were found on the fifty trees, and Mr. Smith, Jr., who supervised the picking, said that there was decided benefit noticeable from the dusting compared with the checks. He was much pleased with the results.

Sweet Cherries.

Three blocks of sweet cherries were sprayed on the farm of Mr. J. W. Smith. The trees were all fairly large. One block of forty-five trees was treated with the dust, another of the same size with the liquid lime-sulphur, and a third of about seventy trees with Bordeaux mixture. All the different plots had received the dormant spray with lime-sulphur for San José Scale.

Results.—Very little difference, in fact, no difference that one could determine, was evident between the three plots, the rot being well controlled on all

three. Check trees in rather less favorable conditions for developing Brown Rot showed that all three methods of treating had been of much benefit, because there were very many more rotten fruits on the checks.

I should have mentioned that the first dusting was done on May 31st when the fruit was about half grown, and the second on June 12th. The liquid sprays were applied the same day, the weather being ideal for doing a thorough job and enabling us to treat both sides the same day.

A noticeable feature in connection with this experiment was that the liquid spray at the time of picking was still very evident, a little too evident, on the fruit. I was afraid that the owner might have difficulty in selling it, but such did not turn out to be the case. On the dusted area there was no evidence that I could see with a hand lens of any of the dust on the fruit at picking time. This shows that the dust could be applied even two or three days before picking, and might in critical weather be of very great value in saving the crop. Of course in such a case the poison would have to be omitted and just the sulphur dust alone used. The liquid spray certainly could not have been applied any later than we applied it without making the fruit unsaleable.

Peaches.

Sixty-five peach trees, thirty-five of them Triumphs and thirty Leamingtons, both varieties quite subject to rot, received each two dustings, but no further mention need be made of this experiment, because even on the checks there was scarcely any rot this year, and therefore no definite conclusions could be made as to the value of the dust for this disease on peach trees. Of course there seems to be no reason why it should not be excellent, especially as the fruit of the peach is very pubescent and will readily hold the dust in among the fine hairs, and as the effect on the cherries and plums against the same disease was good. It was possible to find the dust on the peaches here several weeks after it was applied.

Grapes.

One acre of Roger grapes belonging to Mr. Smith, which had been so infested most years with the Powdery Mildew that he was thinking of removing them and substituting Concords or some other variety not specially subject to this disease, was dusted. Four applications were given, the first May 31st, when the fourth leaf had just appeared, the second June 26th as the blossoms were almost bursting, the third July 27th and the fourth August 26th. On June 24th by a mistake, Mr. Smith's men gave this plot along with his other plots a light spray of Bordeaux mixture.

Results.—The season was not specially bad for Powdery Mildew and there was practically no Black Rot, but on the dusted area only two berries in all were found with any evidence of Mildew and the foliage was equally as clean. There was no burning of the foliage, though the weather at times was exceedingly hot. On the checks there was in some cases as high as 10 per cent. of the fruit affected with the Mildew, the clusters nearest the ground always being worst. The foliage also showed a considerable amount of Mildew. Concord vines alongside of the dusted area had the leaves affected with this disease, but the fruit was free from it. It is therefore evident that the dusting has considerable value in the control of Powdery Mildew, but this season was not a specially good one for testing how effective it would be in a year when the disease was rampant, such as was the case in 1915.

Comparative Cost of Dust Spraying.

On large apple trees I found that the dusting was slightly cheaper, but not more than 1c. per tree for each application. On the sweet cherry trees of moderate size the liquid spray was nearly 50 per cent. cheaper, and on smaller trees the cost was even more in favor of the liquid. This is due to the fact that with a good spray outfit for lime-sulphur or any other liquid spray, small trees can be treated quite rapidly, whereas the treatment of large trees is very slow. Gasoline outfits were used for the liquid spraying.

Comparative Speed of Treatment.

For large apple trees I found that dusting did not require more than about one-eighth the length of time that the liquid spraying did. On the sweet cherries it required from one-half to one-quarter of the time, and on smaller trees it required about half the time. It is much more pleasant to use the dust than to use the liquid, because one's face and clothes do not get wet, and any trouble to the eyes from the dust can be avoided with a little care and the use of goggles.

Caution in Regard to Conclusions.

If I were to judge from my own experience this year with the dust compared with the liquid spray, I should feel very much like being a strong advocate of the dust method; but when one considers the fact that of the other men who used this method in Ontario no one had anything like so satisfactory results as I, and in fact nearly all of them had only half and sometimes not even half as clean fruit as that obtained from the liquid spray, one has to be careful in forming his conclusions.

It is also necessary to remember that in the Niagara district this year Apple Scab was not nearly so prevalent as in the other parts of the Province. Unsprayed orchards as mentioned above, had not more than 60 per cent. of scabby fruit. Of course there was an occasional variety such as St. Lawrence, which had a higher percentage than this. On the other hand, Greening had much lower. Therefore, Niagara conditions were not the extreme test that the conditions in other parts of the Province were. In New York State also, the great majority of those who used the dust did not obtain much more than half as good results as from the liquid spray.

There is in my opinion no doubt at all that the liquid spray held on the leaves very much better than the dust. This was well illustrated, as mentioned above, in connection with sweet cherries, but it is true also to a very large extent of apples. Hence if one is to obtain as good results in a wet season from the dusting as from liquid spraying, it is clear that extra applications will have to be given. In some cases this year I have no doubt that had there been an application with the sulphur dust alone, leaving out the poison, between the time when the blossoms began to open and when they fell, the fruit would have been clean or at any rate a very much higher percentage of it; but points like this show that while the dust method will probably in the long run prove satisfactory, there is need of caution in advising people to purchase dusting machines at the present time.

There is also the fact that in the districts where San José Scale and Oyster Shell Scale are prevalent, we are not sure at all that any satisfactory dust has been discovered that will control this. I tested one type of dust against San José

Scale and found it promising, but not satisfactory, so that in San José Scale districts for some time yet it would be necessary to have an outfit for liquid spraying even if a duster were purchased. My advice, therefore, to the average fruit grower would be not to be in a hurry yet to purchase a duster, but to wait another year or two until we know more definitely its value, and until improvements have been made in the material, possibly in the fineness, and in the manufacture of substances which will control the scale and also Aphids and Pear Psylla. We believe that steps are being taken to devise or discover substances which will be satisfactory against these pests.

Q.—What varieties were they?

A.—Spies and Greenings; the greatest number were Baldwins, Yellow Harvest. Among the worst scabbers we have are the Red Astrachan and the Golden Russet, 20-ounce Pippin and the Fall Pippin. On the Yellow Harvest I counted 1,500 apples and out of the 1,500 we had 3.4 per cent. of scab.

Q.—What mixture did you use?

A.—The Niagara brand 85 per cent. of evenly ground sulphur and 15 per cent. of arsenate of lead.

THE RAILWAY SITUATION.

G. E. McIntosh, Transportation Agent, Ontario Fruit Growers' Association, Forest.

There are about as many opinions as to what transportation is as there are opinions as to what a railroad company can do legally under the Canadian Railway Act. And so to-day transportation, as applied to railroad organization, coupled with the industrial and commercial welfare of the country, is a very complex scheme at best, and is a broad subject.

The evolution of transportation is one of the most remarkable of the age in which we live. The pioneer blazes the trail, others follow, towns and villages spring up, the country becomes productive beyond its immediate consuming capacity, and there arises a need for transportation that will afford broader and better markets for the excess products. Ever changing conditions have of necessity compelled the organization of a system of transportation that will meet the conditions and enable the movement of the products of one distant producing section to the consuming markets of another part of the country. The sparsely settled Provinces in the West, for example, compel transportation, and at such a cost as will permit of the excess products of other provinces being marketed there. In this condition, probably one of the most efficient steps is the kind of transportation, and the rates adopted that enables the marketing of the fruits of Ontario at points thousands of miles from the source of production.

We do not all agree that the railways have by any means attained a point of perfection as regards public service, even under the modern rules of railroad organization, but the point is clear that in "one man's lifetime," there has been a wonderful development along the line of transportation, and especially as applied to the marketing of perishable products. The transportation mechanism that has made possible the shipment over great distances, and the storage mechanism or refrigeration service, making possible the retention of perishable food products for long periods, may be said to really date back beyond 1868. It was at this time, however, the first refrigeration car was devised, but it was not until 1887

that fruits or vegetables were successfully transported for considerable distances in the same car, being re-iced en route as often as necessary.

In all this development, however, the people of Canada have stood behind the railway companies, and for the 35,582 miles of railroad now constructed in Canada they have made to the railway companies a present of something like $1,000,000,000 in cash subsidies, land grants, guarantees, etc., so that it is with no timidity that we persist in our claims for the best possible service and lowest possible rates for our fruit shipments.

These gifts to the railways are made up as follows: Cash subsidies, approximately, $302,196,840; land grants, 55,740,249 acres, at an estimated value of $5 per acre, and the balance consists of guarantees, which during recent years, have to a large extent taken the place of cash subsidies. It is interesting to note that the area of land granted to the railways exceeds the total area sown to field crops, including the orchards and vineyards by 18,336,660 acres.

In their relation to the public, the railway companies are common carriers, subject as such to all the provisions of the civil, and commercial code. They are bound to maintain their equipment and service adequate to the public demand, but because of the urgent conditions of the war placing our Canadian railways in a serious position, and compelling them to meet tremendous difficulties not generally known to the public, let us under present-day conditions find as little fault as possible. For that reason, I will offer no criticism on the service accorded the fruit industry the past season. Our aim to-day, as in the past, is to be constructive rather than obstructive.

That the railways of Canada have been operating for some time past under great difficulties has been known to the public, but the real conditions are known only to the operating officials and the Railway Commission. In 1914, under serious financial and traffic conditions, orders for equipment were curtailed, and in many instances where orders were placed, they were cancelled. The war broke out; unexpected demands were made upon the railways, and in a few months it was found that additional equipment would be required. Orders were then rushed in but could not be filled. Skilled labor gradually became scarcer; steel and other material went soaring in price, until to-day conditions are such that it may be said to be a crime to press the railway companies to purchase equipment at the excessive cost over that which it would be under normal conditions. Refrigerator cars for instance, in which we are most interested, cannot be bought to-day under $3,500 each, yet $1,500 was considered a big price less than three years ago. The railway shops were depleted of men, many of them skilled in their particular line of work. Locomotives, under continuous use, have been kept in repair under great difficulties. Motive power for a time gradually became less instead of greater, and only a few weeks ago several passenger trains were cancelled in order that the freight congestion might be relieved by the use of the extra locomotives. In face of all these conditions, the railways are endeavoring to keep their rolling stock up, as well as devoting part of their shops to the making of munitions. The C. P. R., for instance, received within the past three months 507 box cars, 200 refrigerators and placed an order for 432 more refrigerator cars; the C. N. R. recently added 400 box cars, and the G. T. R. has material ordered for 480 refrigerator cars. No railway in North America, however, is attempting to buy rolling stock this year to compare with last. But everything considered, we must admit the carriers are doing what seems to be all that is possible towards meeting the conditions, in so far as supplying equipment and service is concerned. All shippers, therefore,

should make every effort within their power to lighten the burden of the railroads, under present moment conditions.

It was my privilege to attend conferences of traffic men representing different interests at various times the past year. The matter of traffic congestion was proven to us to be of a serious nature all over the Dominion. Coal and coke shipments in some instances were delayed to an alarming extent, and at one time the American railroads were about ready to place an embargo on all coal cars coming into Canada because the G. T. R. could not move them as fast as they were being delivered at the bridge. I might go on and point out that raw material for munition factories was delayed, and grain movements interfered with to an alarming extent. Yet, the causes, as Sir Henry Drayton said, "are not altogether a railway failure," but include an irregular loading movement overseas, resulting in an uncertainty in the railway movement and consequent congestion of traffic, of itself in excess of the traffic ordinarily offered on Canadian lines."

Whether present conditions will prevail during the movement of the fruit crop the coming season no one knows. It may not extend over the opening of navigation, but it may be longer. The Railway Commission has ruled that the freight movement must be increased, but with the cutting off of 49 or more express trains the troubles of the railways are by no means over.

Though the fruitmen are prepared to bear as much of the burden as is necessary in the prosecution of the war, regret is expressed at the impairment of the express service in the fresh fruit producing sections, and it is just possible some changes will have to be asked for to move the crop and avoid serious loss.

The express companies are not satisfied, and claim the cancelling of passenger trains is an effort of the railways to get back some of the business from the express companies for their freight department. On the other hand, however, freight movements are almost sure to be more prompt, and the supply of refrigerator cars should be greatly improved because of the new demurrage charges, under which cars will be more promptly released.

With a reduced passenger service, the freight equipment will be better maintained, and made more efficient. There will be more room at terminals, and thus a more expeditious movement of freight trains. Except for export shipments, I do not anticipate any serious trouble in regard to the movement of food products or perishable shipments while the war lasts. These will have the preference, and no doubt special efforts will be made to see that all crops are safely marketed. However, we may expect that many of the passenger trains cancelled will never again be scheduled.

What does the year 1917 hold in store for the railroads? How will earnings compare with 1916? What advancement will be made on the part of the railroads, as far as physical and financial betterment are concerned? These are but a few of the important subjects to be considered by the people of Canada. Permission to increase rates, and other favorable decisions of the Railway Commission cannot help but bring ample credit and sufficient credit will prompt the carriers to provide greater facilities, and a broader field means increased revenue. One could follow this trend of thought right down the line. Greater revenue means larger and more frequent dividends, good returns on investments augurs a prosperous public, a prosperous public means more spending to the advantage of the merchant. Thus it can easily be seen that the railroads are truly the arteries of our national life. Therefore everyone is interested in the welfare of the railroads. What effect the cessation of hosilities in Europe will have is another interesting

topic. It is the consensus of opinion that while the railroads must necessarily feel the change in economic conditions, it is also agreed that the change will not be felt until some time after the war ends. Any readjustment of general business must necessarily be felt by the carriers, and for this reason peace will have some effect. War freights of all kinds have undoubtedly contributed heavily to the freight volume and earnings of the carriers, and their withdrawal must lead to a consequent shrinkage. On the other hand, however, reconstruction problems among belligerents will probably lead to large foreign purchasing, so that it may safely be said the railways will not suffer in respect of earnings for some time at least, after hostilities cease.

That Canada should nationalize its railways, telegraphs and telephones, when the war is ended, has been advocated by some of our prominent men and supported by leading newspapers. I do not propose to commit myself upon this point. All I wish to say is, "If we are going to decide wisely on the question of private versus government ownership, particularly in regard to railways, we must get clearly and keep constantly in mind our peculiar conditions, and then try to determine which policy will produce better results under those particular conditions." Germany has adopted government ownership of railways, but Britain adheres to private ownership. Most of the railways of Austria-Hungary are state operated, but most of those of France are still in private hands. Most of the railways of Italy and Russia are state owned, but in the principal country of South America, Argentina, with a mileage greater than that of Italy, and in Canada, with a large and rapidly increasing mileage, private ownership is still greatly preponderant. Japan is committed to government ownership, but in the United States, which alone has a mileage exceeding that of the combined state-owned railways of the world, and 50,000 miles more than the total railway mileage of Europe, private management is the sole policy. The railways of Prussia are the best state managed railways in the world, and yet the private railways of France handle more traffic in proportion to their operating expenses. The private railways of Canada also handle more traffic in proportion to their operating expenses than does the Intercolonial. It possibly is true, however, that the higher expenses of government owned railways are due to the fact that they give better and more adequate service. It is a well known fact that the Intercolonial rates are low, and that for the last year or two at least it has greatly increased its earnings and reduced its yearly expenses. It may also be said, that while traffic is heavy on the Intercolonial, there is no blockade, and it will not be necessary to reduce passenger train service in order to provide motive power for freight. A comparison, however, of freight rates on the state-controlled railways of Europe with those in force in the United States, proves that the latter have reached a much lower level of rates. Therefore Government versus private ownership is a problem with good points in favor of both.

I believe this question will some future day be one of the big problems before the Governments of Canada and the United States. North America with its 305,000 miles of railway—exclusive of sidings—enough to reach from the earth to the moon, and a surplus sufficient to girdle the globe five times—is now the great stronghold of private ownership, but outside of this continent there is a greater mileage of railways in the hands of governments than in those of private companies. People are becoming more and more educated along the lines of public ownership, and the lessons learned from the successes of the Hydro Power Commission of Ontario, in its great undertakings are burying themselves deep in

the minds of the people of this country, who after all are the dictators of the governments. It is possible, and I may say even probable, that government ownership will, after the war, be adopted where private ownership previously existed. Britain long ago adopted the system of public ownership of telegraphs, telephones, street railways, etc., and immediately on the outbreak of the war took under control the steam railways and even the agricultural interests. Other countries at war followed her example. A successful operation of these industries, under war conditions, though it may not be so financially, may demand a continuance under government control after the war, so that when the Allies have tightened the rope now being fixed round the neck of the bully and tyrant of Europe; when they have completed this great task which they have undertaken for the sake of humanity, and have forever crushed the whole system of military barbarism enforced by Germany, nationalization of railways may be one of the great problems to be dealt with, even in Canada. Control of railways under Commissions is a good thing. We have experienced that in Canada, and some of us think the powers of the Commission could be extended without placing the railways under too stringent a control. We realize there is a danger in going too far in this respect, for while stringent control of railways has many advantages, it tends to prevent the reduction of rates. Without the ability to raise rates, experiments in lowering rates in order to build up traffic are not freely attempted by the railways.

In normal times, Britishers or Canadians do not like to see or feel the hand of state interfering in their private business. But we are not living in normal times and we have already learned the lesson that resources of the nation should be mobilized and used to the best advantage.

In the early part of 1916, and I say it with all sincerity, the fruit industry of the province of Ontario was in danger of almost complete annihilation, in so far as profitable marketing was concerned. This was possibly through representations made to the Railway Commission by the different railways in supporting requests for increased icing and heating charges and cancellation of commodity rates. In opposing one of these, the proposed tariff regulating heated refrigerator cars, I contended, "That if the tariff was to be inaugurated because of a temporary falling off of earnings, that condition did not and would not exist throughout 1916. The lack of tonnage in 1914, due to temporary commercial conditions, and increased operating costs began to right themselves early in 1915, and it is safe to say the net earnings of $1,464.84 per mile of line for the year ending June 30, 1915, will for the year ending June 30, 1916, closely approximate those of 1913, the banner railway year, when the net earnings were $2,549.12 per mile of line, or may even carry them beyond. Such is the financial condition of the Canadian railroads to-day, for the C. N. R., C. P. R. and G. T R., each show large increased earnings as late as November and December, 1916, and this at a rate of a trifle over ¾ of a cent per ton per mile. The C. P. R., for instance, reports its net earnings up to June 30, 1916, $49,225,920, a new record for that company by 3 million dollars. Working expenses in 1915-16 were nearly $13,000,000 below those of 1912-13, the banner railway year.

American railroads are also sharing in the good times, and will close the year 1916 with a net income of over one billion dollars, made from an average rate of a little less than three-quarters of a cent per ton per mile.

And while such success is being attained by these railways, I might point out that the railways of France closed the year, ending December 31st, with a deficit of $87,718,500.

Just what the conditions will be after the cessation of the war is a matter of discussion. Prominent railway men have stated that the railroads of the United States will face a critical situation; business conditions generally in that country will be crippled when hostilities cease, and that Canadian railways would share likewise, but in a less degree, because of a dearth of capital, reduction in immigration and keen competition.

You may ask: "What has all this to do with fruit growing or the agricultural industry. Just this. The national debt for war is being piled up in hundreds of millions, and it is upon the agricultural industry we depend to enable us to carry the war burden. The relation between this industry and cheap, rapid and safe transportation is most intimate. Injury to one is injury to both. Therefore, the conditions of both must be studied to profit in that which your interests lie.

In regard to the work entrusted to me by the Association, I will just briefly refer to some of the more important matters dealt with the past year.

At the request of a great many shippers, circulars bearing on the movement of the crop by freight and express were issued from time to time. The intention was to give the shippers, as briefly as possible, such information as would develop by the issuing of new tariffs, supplements, or change of service, the same to afford a ready reference during the busy shipping season. Of each issue 600 copies were sent out, the first being dated June 1st, and the last Nov. 2nd.

During the year replies were sent to 376 enquiries about such matters as claims, rates and service, including several from Nova Scotia and British Columbia, and a few from Washington and Oregon.

Ten sittings of the Board of Railway Commissioners of Canada were attended, in support of applications filed by myself or to defend the rights of the fruit growers on applications filed by the railways.

Twenty-seven interviews on appointment with representatives of the railways, express companies, navigation companies and electric railways were attended.

Several conferences with the transportation managers of the Toronto Board of Trade, Canadian manufacturers, and others were held, at which different matters to be submitted to the commission were considered, and plans of argument decided upon.

Tariffs making certain charges for heated refrigerator cars, in addition to freight charges, were issued Dec. 1st, 1915. On Jan. 25th, 1916, I applied to the Commission for the suspension of the tariffs, contending that the charges were too high. Two or three hearings were held by the Board, and finally on October 26th, 1916, an order was issued, under which the charges were greatly reduced, the estimated saving to the fruit industry on cars of apples that actually moved between the date of our appeal and the effective date of the new tariff was approximately $7,500. These charges amounted to 3 cents per box and 8 cents per barrel to Winnipeg; 3½ cents and 9½ cents respectively to other Manitoba points; 4 cents and 11 cents to Saskatchewan, and 4½ cents and 13 cents to Alberta points. The charges are still too high, and should not exceed the actual cost of the fuel. Fruit growers will feel this extra cost, as probably 60 per cent. of Western shipments move after Oct. 15th, or during the period for which heated car service is required.

During the season of 1914 and 1915, the shipper who loaded vegetables in a car with fruit for points east of Port Arthur, had to either pay the less car load rate on vegetables and the carload rate on the fruit, or pay 3rd class rate, mini-

mum 20,000 pounds on the fruit and vegetables. Instances were reported, however, where the privilege was allowed, but not by authorized tariff, thus making the shipper liable to prosecution. Complaint was made to the Railway Commission and referred to the Canadian Freight Association. The complaint was favorably considered, and the mixing of fruit and vegetables between stations in Ontario and Quebec and to points in the Maritime Provinces to or from which through class rates are published, is now authorized by a tariff becoming effective March 24th, the following rates applying:—

Lots of less than 10,000 lbs., 1st class rates.

Lots of 10,000 lbs. or over, 2nd class rates.

Carloads, minimum 20,000 lbs., 4th class rates.

Under this privilege, the actual saving in dollars and cents, apart from the convenience, can best be estimated by the shippers affected.

The unfairness of charging shippers freight rates on the material supplied for false floors placed in refrigerator cars, not slatted, was presented to the board, and an order obtained, allowing 500 lbs. from the carload minimum, in addition to the $3 allowance for material.

Improvements in the express service at Vineland and Jordan were obtained on presentation of evidence to the Commission on an appeal of the Vineland Growers. The terms of the order being as follows:—

Order 24976, dated the 15th of May, 1916, provides:

(a) That Ottawa shipments be accepted daily, except Sunday, on train 97 from Jordan and Vineland, and when necessary, train 97 be held at Vineland for three minutes, the shippers to help place shipments in car.

(b) That a car be placed at Jordan daily, except Saturday and Sunday; that shipments for the following points be accepted in such car: Port Hope, Cobourg, Trenton, Belleville, Napanee, Kingston, Gananoque, Brockville, Prescott, Morrisburg, Cornwall, Lancaster and Montreal, said car to be picked up by train 97 and transferred to train 20 at Hamilton and train 18 at Toronto.

(c) That, when necessary, train 18 to be held five minutes at Toronto, or until 8.35 p.m. in the event of No. 20 being late, to enable the transfer of said car.

(d) The service mentioned was to be furnished from July 1st to August 31st.

Icing Charges.—The railways issued a new tariff on April 11th, to become effective May 15th, increasing the charge for ice from $2.50 to $3 per ton, and making a charge for hauling the ice, based on the distance the car travels, ranging from $2.60 per car for 350 miles or less, to $10.90 per car for 1,450 miles. An appeal was made in behalf of the fruit shippers, and on May 3rd the effective dates of the new tariffs were suspended until further notice. As soon as the tariff was suspended, other interests began to realize the costly nature of same, and I was asked to permit them to appear in support of our appeal. This was gladly done, and some astonishing evidence has been gathered and presented at the two hearings for Eastern territory. No decision has yet been given by the Board, and I therefore do not care to go into details. Suffice it to say that the mere fact of preventing this tariff becoming effective for the past season, saved either the producer or the consumer the magnificent sum of approximately $30,000. This is what it meant to the fruit industry of Ontario, figured on the actual movement of iced cars during the season of 1916.

Improved express service was obtained at Beamsville through the favorable consideration by Mr. Waller, Superintendent of the H. G. and B., of a suggestion to relieve congestion at the shipping shed terminal by making stops at the ware-

house of Messrs. Prudhomme, Jemmett and Culp, in securing which privilege the council of the village had also to be interviewed and consent obtained.

A splendid eleven-car fruit siding was obtained for Burlington shippers, and still better facilities in the way of shelters are being sought for the section from Hamilton to Toronto, a request now being in for suitable buildings at Burlington Junction, Bronte, Oakville and Clarkson. Several interviews have been held within the past six weeks regarding this accommodation, and while no definite assurance has yet been obtained, I do not think the matter will be permitted to go to the Railway Commission.

The difficulties and loss encountered by the Express Companies in accepting small or L.C.L. shipments of leno covered baskets of fruit was taken up by the Express Traffic Association, and application made to the Railway Commission for permission to refuse such. On the date of the hearing, I met Mr. Burr, chairman of the Association, and was able to satisfy him that the leno package when equipped with a protector, would carry as safely as the patent covered basket. The application was therefore withdrawn, and the Tariffs issued in accordance therewith. As the leno covered basket is rapidly growing in favor, the possibility of having it refused by the express companies was a serious matter to the growers, although it was hardly reasonable to expect them to carry such baskets in L.C.L. lots without some kind of protection. The above method, however, will assure equal delivery with the patent covered baskets, and the cost is not very great.

Express Classification.—The Express Traffic Association of Canada, submitted on June 8th, for approval of the Board of Railway Commissioners, Supplement No. 10 to Express Classification No. 3, covering certain changes, cancellations and additions. A synopsis of the changes affecting fruit shipments was prepared and mailed to several of the large shippers on June 12th, and on July 7th our objections were filed with the Board. Rule 26, as proposed, would annul the wagon delivery service for fruit shipments under the present special carload tariff.

Mr. Burr was interviewed on this matter, and other minor objections filed. The question of delivery service for fruit shipments was, however, the most important, and it was finally decided that our objections to the supplement would be withdrawn on condition that the fruit tariffs would be amended to permit of a delivery service for this commodity being continued. This was consented to by Mr. Burr, and the Railway Commission notified on what conditions the objections were withdrawn.

Express Service from Prince Edward County.—Points along the Canadian Northern from which fresh fruit shipments are made have reason for complaint in regard to the express rate to points east. This matter has been under discussion with officials of the Canadian Northern Express Co., but up to the present we have been unable to obtain satisfactory concessions.

On August 11th, lake and rail service via Northern Navigation Co., from Sarnia to Sault Ste. Marie, Ont., or traffic to other points which necessitated a transfer from steamers at Sault Ste. Marie, was cancelled. Owing to the fact that the Soo is a distributing centre for a large amount of fruit, the matter was taken up with officials of the above company. We found the embargo was necessitated, because of conditions then appearing beyond the company's control. Mr. Gildersleeve, manager, and Mr. Robinson, general freight agent, were interviewed, and assurance was obtained that schedules would be so arranged for the 1917 season that the service to the Soo would be maintained throughout the season.

Judgment was given by the Railway Commission in the Eastern Freight Rates Case, which was before the Board for two years. The all round increase asked for by the railways was not granted, but each rate was considered on its merits, the increase varying according to the locality and commodities affected. In so far as the class rates are concerned, the fruit industry bears a proportional increase of two cents in the first and one cent in the fifth classes on eastern shipments.

Tariffs have been issued under this order, and in checking them over, I find the increase in nearly all instances is under two cents a barrel. No order has yet been issued regarding the Fruit Commodity rates, under which the greater part of the crop moves, and in which we are more particularly interested.

It is a well known fact that the fruit growers of Ontario are to-day struggling under many difficulties in the way of profitable marketing. The cost of production is increasing with fruitmen just the same as the alleged increased cost of railway operation. You must protect yourselves against additional costs just the same as other interests, and for that reason I have endeavored to prevent the cancellation of commodity tariffs. These tariffs cover shipments into Western Canada, and, I think it is a fair estimate to say 70 per cent. of the commercial apple crop for shipment is marketed there. The present rates are reasonable, and our contention is that neither the carrier, nor the Railway Commission should disturb a long-standing system of rates without a careful consideration of the effect on property interests; that sale prices in the Western markets have been regulated to some extent by the non-profitable dump prices obtained by American growers, and that Ontario growers cannot afford to pay higher transportation charges under such conditions. Railway records also prove that a much larger profit is obtained by hauling large quantities of goods at low rates than small quantities at high rates. Therefore Commodity Tariffs are beneficial to the carriers. The saving of $7,500 on heated car service and $30,000 on increased icing charges for one season, is an example of the extreme limits to which the railways will go in their efforts to increase earnings, without apparent consideration of the effect upon the interests which are forced to bear these charges. It cannot, therefore, be too often asserted that each interest and particularly the agriculturists, should be ever alert to proposed changes affecting marketing advantages and privileges. To be neutral in this respect might be destructive.

The increased demurrage rates received our support, because the fact that consignees use cars for storage purposes, is one of the reasons why we experience a shortage of refrigerators each year. But in supporting the proposed changes, the Board was asked to deal with the question of average or reciprocal demurrage which has been before them for sometime.

A new Canadian Freight Classification has been submitted to the Board of Railway Commissioners for approval. It is a complete revision of Classification No. 16, and in providing Rules and Conditions of Carriage, description of articles, packing requirements and carload minimum weights, the carriers have largely adopted such changes as are compiled and incorporated in the Official and Western Classifications. It is claimed that the movement of traffic between a large portion of Canada and the United States is governed by two classifications—the Canadian and either the Official or Western—and owing to the constant increase in the interchange of freight traffic between Canada and the United States, uniformity in rules, packing requirements, etc., where such would harmonize with conditions prevailing in Canada, was desirable.

It would be impossible to attempt a review of the many changes proposed.

A few, however, that are of particular interest and importance are brought to your attention.

Rule 10, Sec. 3, reads.—"Owners are required to load into or on cars and to unload from cars all freight carried at carload ratings. If, in the instance of shipments tendered in less than carload lots, but upon which the carload rate and minimum is applied as provided in Section 1 of this Rule, such service is performed by carriers' agents, a charge of one and one-half (1½) cents per 100 lbs. will be made for loading and a like charge for unloading.

Under the present classification all carload shipments under 2,000 lbs. per piece, and all freight in 1, 2, 3, 4 and 5th class is loaded and unloaded by the carrier.

Rule 17 reads.—"Freight loaded by shipper when not checked by carrier, will be receipted for as 'Shippers Load and Count.'"

Under the reading of this rule, the agent may so delay sending a checker that it would be impossible for the shipper to wait. The rule should protect the shipper if he but notifies the carrier, and will of course do so, except at private warehouses or sidings.

The only changes affecting rates on fruit, is the cancelling of the rates on grapes in barrels for wine purposes.

Objections to the changes mentioned and a few others of less importance have been filed with the Board.

There are many things the growers need in making the fruit business a success, but one thing you must have is proper transportation in order to develop wider distribution. In this regard, I may briefly say an extension of the special commodity tariff on rates to additional points in Western Canada; an improvement of express service to Northern Ontario points; and better transfer service at divisional points, whereby such unreasonable delays as 24 hours at Toronto will be alleviated; are a few of the necessities.

In the United States, railways are not permitted to own steamships. I believe that is a good thing. It is wrong that railways should own, operate and control shipping. There are other grievances—many of them—but time will not permit a reference to all.

Delay in transit is one of the most costly problems with which the growers have to contend. You who are in the fruit business know where the markets are, and can sell in those markets providing the carriers get them there without the terrible delays experienced. Proper and reasonable delivery is what we must have. Rates are but a secondary consideration, and in that regard the Allies "Pinchers" are nothing compared to the dilemma the shippers are in. If they ship too much the rates go up, so the railroads can buy more equipment. If they don't ship, the rates go up because the railroads are not earning enough revenue. We are now entering upon a year that is perhaps of greater importance to the shippers than any of the past ten. The greatest effort is necessary to hold your present privileges and prevent additional charges which in reality are covered by the present rate. I refer to heating, icing, cartage, etc. It is this unfair method of overstepping authorized rates and developing a total prohibitive rate that hurts. We want nothing that we are not entitled to, but we do want justice.

In conclusion, it may fairly be said that we are demanding on the part of the railways better and safer roadbeds, double tracking, more adequate terminals, and improved equipment throughout, in order to secure more satisfactory service. The railways feel it incumbent upon them, as far as possible, to meet these de-

mands, and they must do it, either by providing funds out of net profits, or by additions to capital stock. In some cases, it is understood that our railways have spent many millions during the past few years out of their net returns, for betterments such as above indicated. This policy has probably prevented them from paying dividends upon their capital stock, and, therefore on this very account, it is harder for them to raise additional capital in the money markets of the world. In such cases it might well be asked if this is a condition calling for higher freight rates. It is like a manufacturer putting all his profits into increased construction, equipment and betterments, thus preventing dividends being paid to shareholders, and then seeking to right the situation by advancing prices to customers.

OUR METHOD OF GROWING AND HANDLING STRAWBERRIES IN THE CLARKSON DISTRICT.

C. R. Terry, Clarkson.

Seven years ago this spring we landed in Clarkson with a large family of young children and located on a farm, just west of the Grand Trunk station, which was very conveniently situated, especially for the shipping of fruit to the Toronto market.

Unfortunately, the farm we chose as our home had had a great lack of man power, hence weeds were everywhere in evidence. To my way of thinking we had no land in suitable condition for setting out a patch of berries that year; but as I had made up my mind to grow strawberries, we planted a little more than an acre on land which had grown corn the previous year. Being strangers to the business we were compelled to work on advice which was freely given by kind neighbors, and which was thankfully accepted by us and followed as closely as possible.

First. We will take the question of the soil. I have planted on various kinds of soil from the very dry to the very moist, on land with a dark surface and a subsoil of dry sand, on land with just a little clay in the subsoil and on land with a subsoil of quicksand, and have found after giving the same attention to the surface that in every case we pick more berries off the land with the quicksand subsoil. The plants on the quicksand subsoil will stand up in dry weather and keep on bearing fruit quite as well or better than if we had frequent showers.

Second. The preparation of the soil. I have found that it suits our conditions best to manure at the rate of about twenty-five tons to the acre. Plow in the fall and in the spring as early as possible, cultivate and keep on stirring the surface, not too deeply, as often as needs be, which depends on weather conditions until time of planting.

Third. About May 15th to 24th we find the best time for planting. We have planted as late as the first week in June with good results. After thoroughly cultivating the land we roll it, as it plants very much nicer, preventing the soil from slipping in at the back of the spade when pressing it forward to admit the plant. We plant in rows forty-two inches apart, and set plants from eighteen to twenty-four inches in the row according to the nature of the soil. We always plant by line as we are anxious to have the rows as straight as possible, because they can be cultivated to a better advantage and present a better appearance.

Fourth. As soon as possible after the planting is finished, the patch is cultivated and followed with the hoe to move the surface about the plants and retain the moisture, as well as to disturb those little weeds which have the habit of making their appearance very early. We have no hard and fast rule for cultivating, as a great deal depends on weather conditions. If it rains every week we cultivate every week if we can, as we believe it best to keep the surface loose. Strawberries like other things take kindly to the hoe and always respond to a gentle application, and there is no danger of giving them too much of it. We always try to have them absolutely clean before they start to send out runners. When the runners appear we set them by hand, unless they happen to take root in the proper place. We grow only the matted row, and train the runners as nearly as we can to have the plants from two to three inches apart each way because we find they fruit better if not too close. It is well to keep the cultivator going as late in the season as possible and when it is impossible to use the hoe it is well to pull any stray weeds by hand. During the summer, when hoeing we aim to hoe the soil up to the plants to make a crown to the row, as this is a good method to prevent loss from ice during the winter in time of a thaw followed by a sudden freeze before the water has had time to get away.

Fifth. Now let us consider the covering of the berry plants, for the winter. The time best suited is as soon as the ground is frozen solid; but unfortunately, we are not always able to follow out our belief. We do our covering oftener in the early part of March than any other time because our time is so much taken up draining and repairing until very late in the fall. I do not approve of covering a lot of snow, choosing rather to cover just when the snow has nearly gone, than to seeing the manure leaking out and the black liquid running away to the ditch to be carried to the lake. We generally use about sixteen tons of long strawy manure to the acre for covering.

Sixth. Now we have our plants through the winter and the first thing to do is to uncover them, the time of which varies considerably according to weather conditions. If we have a very early spring and the plants start to grow up through the covering and we are afraid of frost, which by the way never does much harm, we go over the patch with forks and loosen the covering to prevent smothering in some cases and the breaking of foliage in others. In a few days we remove the covering into the paths between the rows, which prevents the weeds getting through, retains moisture and serves as a cushion to kneel on while picking.

Seventh. As far as possible we prevent the weeds from showing. If grass or weeds do appear, the best time to destroy them is in their youth as the larger they get the more they rob the soil of the food the plant should have in order to produce the best crop. If perchance the weeds do get ahead of us, we find it very bad practice to pull them at picking time as it usually loosens the soil around the roots of the plants allowing the air to enter causing a heavy loss in the crop.

Eighth. We find the matter of picking the most disagreeable part of the business. It is very difficult to obtain pickers who will take as much interest in picking a good box of berries as we do in growing them. We generally engage girls and women to pick for us paying one cent per box and board.

We always hire one reliable person to help with the packing of the berries and endeavor to grade the fruit so that each crate will be as nearly uniform in quality as possible. We use the twenty-seven box crate only.

We sell about forty per cent. to the Montreal buyers, the balance we ship to the commission merchants in Toronto, except a few crates to the surrounding towns and villages.

You will notice, if you have followed me closely, that we have covered a period of upwards of eighteen months since we commenced operations, to secure the crop we have just marketed at considerable cost to us in time and money. While we take great pleasure in our work, we do not work for pleasure only but naturally look for a fair remuneration for our efforts and very seldom fail to get it. We harvest from five to ten thousand quarts per acre, which we consider a good yield, and with prices as they have been for the past few years we look on the strawberry as the mortgage lifter. We have a considerable amount of soil in the Clarkson district well adapted for strawberry culture, and some very fine yields have been obtained. I have realized upwards of one thousand dollars per acre; no doubt others have done better. In conversation with the President of our Clarkson Fruit Growers' Association a few days ago, he informed me that he had taken one thousand dollars per week for three weeks off a two acre patch, and I am satisfied that there are others who have done equally as well. To give you some idea of the extent of the industry in our locality it might be well to quote the number of berry boxes purchased by our Association. Last year we purchased one million and a quarter, this year eight hundred thousand. I find in looking over past years we average about a million boxes a year, about eighty per cent. of which are used for strawberries.

MR. KYDD: I think you mentioned in your varieties that you were growing the Williams.

MR. TERRY: No, I did not mention any variety. The principal variety grown in our district is the Glen Mary.

Q.—Are not there a great many Williams strawberries grown there?

A.—I planted a few rows of the Williams, but I never planted any after. I do not believe there is an acre of Williams berries in the Clarkson district.

MR. KYDD: I am glad to hear that there are so few of them, because we people in Toronto do not want to eat them, and if you producers would try and grow the berries we want to eat, you would sell more of them. I have gone through the stores of Toronto during the strawberry season, and I could not get a strawberry that was not a Williams. I know their good points, but I hate to eat them.

MR. TERRY: I think I am safe in saying every farmer has the Glen Mary berry in our district, and a great many have nothing else. One grower packed last year 600 crates of Glen Mary in one day.

Q.—What are the prospects for this year?

A.—Our plants have not made the rows they did other years, and although the rows are not as wide, it is possible we may harvest as good a crop as other years.

MR. CLARK: Does any one know if the Glen Mary is equally good for canning purposes as the Williams?

MR. TERRY: We have no canning factories in our district.

MR. CULVERHOUSE: I have had a slight experience with the canning of Glen Mary and have heard the opinion of other canners, and they say it is a little too soft for canning purposes. It tends to go down in shipment, and worse still in the process, whether of jam making or straight canning. I agree with the last speaker that for home use. we prefer the Williams every time. It does not melt

away; it stays as the housewife wishes to have it stay which a softer berry will not do. I know as well as Mr. Kydd knows that the Williams is subject to a green tip.

MR. KYDD: I object to the core as well as the green tip.

MR. FOSTER: I do not think the Williams strawberry always has that disastrous core. In a very much overgrown berry it is more subject to the core or even a hollow place, but after the first picking or so the green tip will disappear. We hardly think the green tip is a serious matter. I believe the Williams strawberry will arrive on the market in better condition than any other berry that I know of at the present time.

MR. KYDD: I will admit it will arrive on the market in better condition and come back to you from the market, but you cannot make me believe it is a good strawberry for domestic use. It has a tip that will never ripen until the back end is beginning to rot, and it has a core that you chew and chew and then cannot get through.

MR. LOVEKIN: Do you grow any really early berry for the Toronto market?

MR. TERRY: There are very few of the early varieties grown. A few years ago a number of the growers on the higher land grew Bederwood. They realized a very good price for them, but they had a very small crop. In fact, I never heard of them or saw them any more, but the Glen Mary is about the only berry we use at Clarkson.

A MEMBER: Do you find the most rapid method of setting your plants is by the spade?

MR. TERRY: That is the only method we use. We have never used any other method, and I have never seen any of our neighbors plant them in any other way.

MR. CLARK: I would like to ask a question as to the blight that affected the strawberries last year. It was quite a serious problem down in Prince Edward County.

MR. CAESAR: I visited a few places where the blight was troublesome. Do you mean the leaves got curly and thickened, or do you refer to the trouble with the roots?

MR. CLARK: It was the root in Prince Edward County.

MR. CAESAR: There has been a great deal of trouble in various places with the root. I visited a large acreage in Norfolk, and just about the middle of the picking season they went right off; they got one or two pickings, and then they went right off, and I think the same thing happened in several other places. It is a very puzzling thing, and personally I do not know what to make of it. I was inclined to think in some way it was due to either winter killing, which was not severe enough to prevent the first picking, but when the weather got drier as it does in the strawberry season, the roots could not supply the plants with the necessary food, or it may be that in some cases it is due to a strain of berries that is not suited for that particular kind of soil. I should like to hear Mr. McCubbin's opinion on that.

MR. MCCUBBIN: I started to work on this trouble last spring, and I was compelled to give it up for pressure of other work, but I believe what Mr. Caesar has said is quite right, except that I found a fungus associated with the disease. I was unable to go on with the work, and determine the cause and find a remedy, but there is a fungus connected with the disease as well as weedy conditions of the soil, and possibly winter killing or unadapted plants.

THE CHAIRMAN: How does Mr. Terry handle the two and three year old patches?

MR. TERRY: As soon as we are through picking we go in with a mower and cut off the tops and rake them up with a horse rake and plow our row to about eight inches and then roll, and then we weed carefully and get in with the cultivator, as soon as possible. The plants send out runners and we never find any difficulty in getting plenty of rows, and we treat the three year old the same as the two year old, and we find we get almost as good a yield on the three year old as on the two year old. In fact, last year our best patch was our three year old, and I hated to turn them under last fall.

Q.—Why would you plow it down?

A.—I believe the strawberry plant takes out of the soil something that is peculiar to the strawberry, and I think it is well not to drive the land too hard. If you have a good horse do not work him to death because he is a good one.

LIGHT CROPS AND THEIR CAUSES.

W. T. MACOUN, DOMINION HORTICULTURIST, OTTAWA.

The short crops which are experienced more or less frequently in all parts of Canada are very disappointing and discouraging to the fruit grower. No matter how good the price for fruit may be, if a man has not got much of it he benefits but little by the price. Furthermore, a good crop one year and little or no crop the next brings down the average returns very much and makes the fruit business, especially when one depends on apples or peaches alone, a rather precarious one. If I could, at the outset, assure you of good crops every year by following certain methods, I should be glad to describe such, but there are conditions, such as the weather, which are beyond our control, and while we may, by the use of fire pots, ward off frost at a critical time, practically no means has yet been devised of preventing rain or making very cool weather warm or of causing rain in time of drought, these being important factors in fruit production. The season previous to the light crop may have an important bearing on that crop. It is not yet fully understood as to what are the climatic conditions most favorable to the development of fruit buds, but it is known that most of the fruit buds are formed in June or July of the year before the crop. If the trees, therefore, are defoliated by caterpillars or apple scab or foliage injured by other insects or diseases, it should not require any great effort to believe that there could not be the same development of fruit buds as if the leaves of the tree were all healthy and remained on the tree all summer, nor is it hard to believe that even if buds developed sufficiently to form flowers that the buds might not be in a vigorous enough condition to ensure the setting of the fruit. Much more experimental work is still needed in this direction, however. We do not, as much as we should, know how much the development of fruit buds depends on the temperature or the general character of the weather in the season previous to the light crop. How, also, for instance, does a summer which is very dry and warm, followed by a warm wet autumn in which new growth starts and some flowers appear, affect the crop for the following year? How does a severe winter affect the flower buds, or very late autumn growth followed by severe frosts?

Before going any deeper into our subject it may be well to give a list of at least some of the things which affect the setting of fruit. They are: (1) The condition of the trees and the weather of the previous year. (2) Winter injury to fruit buds. (3) Temperature and humidity at the blooming season. (4) Pollination. (5) Soil moisture immediately after the blooming season. (6) Fertilizers. (7) Diseases. (8) Insects. (9) Thinning. (10) Summer pruning. (11) Spray injury.

Something has already been said in regard to the season previous to the light crop and the condition of the trees, but the following data in regard to set of fruit from spurs of various kinds will show the importance of having vigorous spurs, and vigorous spurs cannot be obtained without good foliage. These figures are taken from a paper on "The Abscission (or falling off) of Flowers and Partially Developed Fruits of Pyrus Malus (the apple)," by A. J. Heiniche, Ithaca, N.Y., read before the Society for Horticultural Science at New York on December 29, 1916.

Baldwin branch with 251 flower-bearing spurs.
Average weight of 139 spurs which did not set fruit, 1.45 gramme.
Average weight of 112 spurs which did set fruit, 2.76 gramme.

Baldwin branch with 88 spurs.
Average weight of 30 spurs which held fruit less than two weeks, 2.94 gramme.
Average weight of 28 spurs which held fruit until the June drop, 3.29 gramme.
Average weight of 30 spurs which held fruit after the June drop, 4.27 gramme.

Baldwin branch with 677 spurs.
Number of spurs making more than 1 centimetre of growth during 1915, 320, of which 67.2 per cent. produced fruit.
Number of spurs making less than 1 centimetre of growth during 1915, 357, of which 25.5 per cent. produced fruit in 1916.

Baldwin branch with 443 spurs.
Number of spurs with 4 flowers, 50; percentage bearing fruit, 20.00.
Number of spurs with 5 flowers, 137; percentage bearing fruit, 40.9.
Number of spurs with 6 flowers, 266; percentage bearing fruit, 54.9.

Fallawater branch with 59 spurs.
Average weight of all spurs which produced 4 flowers, 1.76 gramme.
Average weight of all spurs which produced 5 flowers, 2.73 gramme.
Average weight of all spurs which produced 6 flowers, 3.36 gramme.

Baldwin branch with 225 spurs.
Average weight of 74 spurs with small conducting tissues (1 to 1.4 mm. in diameter) 1.50 gr.
Average weight of 112 spurs with medium conducting tissues (1.5 to 1.9 mm.), 2.47 gr.
Average weight of 39 spurs with large conducting tissues (2.0 to 2.5 mm.), 3.27 gr.

The above figures and others which might be quoted show that the largest fruit spurs set the largest proportion of fruit; that the largest number of flowers in a cluster was on the largest spurs. They also show that the largest conducting tissues or channels through which the sap flows were in the largest spurs, making it evident that the spurs through which there could be the best flow of sap, set the largest number of fruits. Not only is it important to have large spurs with good sap conducting tissues but it is important to have an abundance of moisture available in the soil when the trees are in bloom and the fruit is setting.

Winter Injury to Fruit Buds. Comparatively little is known in regard to winter injury of fruit buds though light crops of peaches are often rightly attributed to winter conditions, and there is evidence to show that the fruit buds

of such hardy fruits as apples and pears may be badly injured even though the tree is not killed back. The winter of 1910-11 was a very severe one in Montana, and the Agricultural Experiment Station there made a special study of the fruit buds of apples and pears and found a large percentage killed. There was much very cold weather, and when the buds did thaw out there were very high winds which apparently prevented the sap, which had been withdrawn from the cells into the intercellular spaces during freezing, from returning, as the high winds evaporated it. There were 98 per cent. of the buds of Whitney Crab killed and 94 per cent. of Transcendent Crab. "A Flemish Beauty pear tree loaded with fruit buds did not produce a single flower." In the spring leaves pushed out from the fruit spurs but no blossoms developed. Microscopical examination showed the withered fruit buds. There is no doubt but that such conditions frequently occur in Canada. The cause of light peach crops can often be traced to sudden changes of weather in winter when the temperature goes considerably above freezing and then suddenly there is a hard freeze. The examination of cherry buds at Ottawa during the past two winters has shown that the injury which is so frequent at Ottawa is not due—at least, not as a rule—to cold weather but to changeable weather, although there are, no doubt, minimum temperatures lower than which fruit buds of different kinds and varieties will be killed. Although the temperature has been 20 below zero this winter, there has been little injury so far, as there has been no thawing since early in the winter. The fruit buds of European and Japanese plums are killed nearly every winter at Ottawa, and, while these have not been examined at intervals during the winter as have been the cherries, it would, doubtless, be found that in an average winter most of the injury occurred after sudden changes of temperature.

Unfavorable Weather in Spring. Perhaps one of the commonest causes of short crops in some places is unfavorable weather at the blooming season; low temperatures and rain making very unfavorable conditions for the setting of fruit.

In Bulletin 299 of the New York Agricultural Experiment Station, by Prof. U. P. Hedrick on "The Relation of Weather to the Setting of Fruit with Blooming Dates for 866 Varieties," in which the weather records and crops for the years 1881-1905 have been compared, these being based on the County reports of the Horticultural Society of Western New York, Prof. Hedrick states:—

"In New York, unfavorable weather is probably the predominating one of the several factors which cause the loss of fruit crops during blooming time."

"Late frosts ruined the fruit crop in Western New York in 1889, 1890, 1895, and 1902. The fruit crops of 1884, 1888, 1891, 1893, and 1903 were seriously damaged by killing frosts. Besides the above years, pears, peaches and plums were more or less injured by frosts in 1892, 1896, and 1900. Fruits were injured at blossoming time by frosts in thirteen years out of twenty-five under consideration."

"Wet weather almost wholly prevented the setting of fruit in New York in the years 1881, 1882, 1883, 1886, 1890, 1892, and 1901. Rain is mentioned as one of the causes of the poor setting of fruit in the years 1888, 1889, 1891, 1893, 1894, 1898, 1905. Of the seasons given above, moisture came at blossoming time in the form of snow in 1899 and in 1891. Gales of wind accompanied the rain in 1881, 1882, 1883 and 1905. The rainfalls came in periods of prolonged cold weather in the years 1881, 1882, 1883, 1886, 1888, 1889, 1891, 1892, 1894, 1898 and 1905. In 1890 the rainy weather was hot and sultry Frosts and cold weather accompanied the rains in 1888, 1889, 1890, 1891 and 1892."

"Rain and the cold and wind that usually accompany it at blossoming time cause the loss of more fruit than any other climatal agencies. The damage is done in several ways. The most obvious injury is the washing of the pollen from the anthers. The secretion of the stigmas also is often washed away or becomes so diluted that the

pollen does not germinate. It is probable that the chill of rainy weather decreases the vitality of the pollen and an excess of moisture often causes pollen grains to swell and burst. Rain also prevents bees and insects from carrying pollen."

Most fruit growers now know how pollination and fertilization of the flowers take place. Just as the flowers are opening, if conditions are favorable, the anthers containing the dust-like pollen burst open and the pollen is shed either onto the stigma of its own flower or is carried by insects to another flower or flowers where it adheres to their stigmas. The individual grains of pollen are very small and a number of them, under favorable conditions, reach the stigma which, when it is in the best condition, is moist, and holds the pollen grains better than if dry. If conditions remain favorable these tiny pollen grains germinate, or at least some of them do, and the strongest and most active throw out a tube which pushes down through the soft stigma and style until it reaches the ovule and finally the embryo sac, and when its cytoplasm meets that of the female organ fertilization takes place.

Now, if certain conditions are unfavorable, the stigmas of self-sterile varieties may not receive any pollen from other varieties to fertilize them and little or no fruit will set. Again, if certain other conditions are unfavorable, pollen, if it germinates at all, may not have sufficient vigor to develop a pollen tube which will reach the embryo sac, and again, as has been stated above, pollen grains may swell and burst without germinating.

Mr. F. Adams, of the Botanical Division at Ottawa, found by experiment that there was only slight germination of apple pollen and the pollen tube only partially developed at a temperature of 40 to 44.3 deg. F., and the most favorable temperature for the germination and development was from 69.8 deg. F. to 73.6 deg. F. Prof. Sandsten of the Wisconsin Experiment Station found the best temperature for the germination of apple pollen to be 75.2 deg. F., his experiments having ranged from 59 deg. F. to 96.7 deg. F. Prof. Kraus of the Agricultural Experiment Station, Corvallis, Oregon, states that 65½ deg. F. to 83 deg. F. may be considered as suitable for the majority of tree fruit pollen. It will thus be seen that should the temperature run pretty regularly below 70 deg. F. during the blooming season fertilization is not likely to be good. Prof. Hedrick, in New York State Bulletin 407, published in May, 1915, on "The Blooming Season of Hardy Fruits," states that during the season of 1915 "Mr. W. F. Friedman, a student assistant at this Station, has found that pollen grains of practically all fruits burst and will not germinate in water," showing what effect excessive moisture might have in preventing germination of pollen. It is further stated in the same bulletin, "From this work, extending through the whole blooming season of 1915, there could be little doubt that the action of rain on pollen is quite a potent factor in preventing a set of fruit due to its injurious effect on the stigmatic juices." Sandsten found that pollen burst when in masses during warm rains. Adams found pollen germinated in the anthers before being shed. This might occur during a fairly moist warm period. It will be seen from the foregoing that not only is moderately warm weather necessary during the blooming period, but that bright sunny weather is desirable also, and a long spell of cool wet weather beginning when the flowers are opening is very unfavorable to pollination. In addition to the cool wet weather unfavorable to the germination of pollen and unfavorable to fertilization, there may be frost. Fruit blossoms in bud will stand more frost than when they are fully open. When the petals fall less frost will cause injury that when the trees are in full bloom. From five

to seven degrees Fahrenheit of frost are likely to cause severe injury to apples when in full bloom, and after the bloom has fallen, from four to five degrees may do much harm. Much depends on the length of time the flowers are frozen and on the weather following the freeze. There is often frost at Ottawa when the native plums are in bloom, as they bloom early and sometimes the crop is practically a total failure from this cause. If the flowers have been injured by frost, an examination after the petals are open, if the frost occurs when they are in bud, will reveal the centre of the flower or pistil discolored or brownish. The fruit will not set when the flowers are injured in this way. The frost may, however, come after fertilization has taken place when the fruit may set.

Experiments have been made with orchard heaters at Ottawa for several seasons and while, as yet, no results have been obtained which show an increased crop from the use of the heaters, as the weather has not been cold enough at the blooming season when the heaters have been in use to demonstrate their value, yet it has been shown that the temperature can be raised considerably. On the night of May 20, 1915, sixty-three "Competition" heaters were used in an apple orchard over an area of 32,564 square feet, or at the rate of eighty per acre. At 1 a.m. an alarm came in that the temperature had reached 34 deg. F. and by 1.30, when the heaters were lighted, it had fallen to 32 deg. F. The ground temperature that night fell as low as 31 deg. outside the orchard, when the ground temperature inside the orchard was never below 34 deg. after the heaters were lighted. At three feet from the ground the temperature outside was 32 deg., while inside it never fell below 36 deg. after lighting the heaters. On May 27 the heaters were lighted at midnight when the ground temperature was 32 deg., and 34 deg. was registered three feet above the ground. By 2 o'clock the temperature outside stood at 28 deg. on the ground and 32 deg. three feet from the ground, while inside the orchard the ground temperature was 33 deg., and the temperature three feet above the ground was 37 deg. On this night the heaters were used at the rate of only 60 per acre. This demonstrated that in an orchard of one acre, sixty heaters of the Competition type are capable, under certain conditions, of raising the temperature of the air surrounding the trees, 9 degrees. From our experience with six different types of heaters the following kind of a heater is recommended.

1. One with a large capacity, or not less than four gallons.

2. One with a good draft control. Proper control of draft is very important, for it allows the operator to increase or decrease the fuel consumption, as he desires, thus increasing or decreasing the amount of heat given off per hour.

3. Round heaters are preferable to square or longitudinal ones, as they do not warp so readily.

Cross-pollination. It might be thought that enough had been said about pollination but there is still another important phase of it to consider. Experiments have shown at Ottawa that a large proportion of varieties of apples are self-sterile or practically so, and need pollen of another variety to ensure a setting of fruit. In 1915, for instance, of twenty-nine varieties tested only five varieties set any fruit at all and only one was decidedly self-fertile, whereas when thirteen of the same varieties were cross-pollinated, only two failed to set fruit. Most of the pollination of apple blossoms is done by insects, hence it will be readily seen that if the weather is unfavorable for insects to work, fertilization is not likely to be good. Some varieties of apples, though self-sterile in one place, do not appear to be so in another, and this is being studied in order to learn the cause.

In the case of some kinds and varieties of nuts, the pollen and the pistil are not mature at the same time, and one may be too far gone to effect fertilization before the other is ready. It is probable that further studies in pollination will show that this happens with varieties of apples, and that certain climatic conditions will cause either the pollen or pistil to mature first while, under other conditions, they may mature at the same time or one may remain in good condition long enough for the other to catch up. In studies of the pollination of pecans in Georgia, Prof. Stuckey informed me recently that one cause of self-sterility in pecan varieties was that the pistil was mature before the pollen bearing or staminate. With other fruits, and with other varieties it might be reserved. From observations at Ottawa we believe that the stamens which bear the pollen mature quicker in high temperatures than the pistil, hence pollen of a variety might be shed before the stigma was ready. The pollen and pistils of some varieties may mature at different temperatures to others. These are things that have yet to be worked out. The fact, however, that cross-pollination among varieties is desirable has been well demonstrated, hence the importance of having favorable conditions for this to take place. Apple blossoms do not all come out the same day and sometimes, if the weather is cool, the blooming season of one variety will continue for between two and three weeks or perhaps longer, but in a warm dry season it may only last five or six days. To be sure of the best conditions for cross-pollination it is desirable to have varieties beginning to bloom at the same time in the same orchard, and preferable to have the rows alternating or, say, two rows of one variety to four of another, so that in case there is only a limited time when conditions are favorable for insects to work they will lose the least amount of time in pollinating. In some seasons when the weather is unfavorable for pollination there will, no doubt, be an advantage in having a variety that begins to bloom a little later than another as the pollen from it might catch the later blooms of the early variety at a time favorable to pollination when the main blooming season of two varieties blooming at the same time might be unfavorable. All these things are well worth considering in planting orchards.

Comparatively little is known yet as to the cause of the June drop of apples, which in some years is very heavy. This may be due to only partial fertilization, the pollen tube having germinated, but failed to fertilize the ovary. It may be due to unfavorable weather, or soil conditions which check the growth of the tree, causing a certain proportion of the fruit to drop. This checking of the growth might be due to water soaked cold soil, or it might be due to very dry soil, or it might be due to very cool weather. It has been stated that aphids cause enough irritation about the pistil to cause the apple to swell a little but not being properly fertilized it drops off later. But there is much to be learned about this June drop yet.

Soil Moisture at Blooming Time. The importance of a good supply of moisture in soil when the fruit is setting was noticed at Ottawa in 1911, when there was a very hot dry time from the blooming season until well on into the summer and a relatively small crop set. It is important to plow a cover crop under early and start cultivation early in order to conserve moisture at that critical season of the year, in case there should be a dry time, as the loss of moisture from ground not cultivated and especially when there is a growing cover crop may be very rapid.

Fertilizers. Little will be said in regard to the value of fertilizers in obtaining good crops as the results from the use of fertilizers might be quite

marked in one orchard while in another where the soil was somewhat different it might be difficult to find any marked advantage in their use, but when it is known what kind of plant food the soil really needs the results may be quite striking. Such results were recently presented by Prof. Lewis of the Oregon Experiment Station at a meeting of the Society for Horticultural Science in New York on December 28, when he showed that by the application of 6.7 lbs. of nitrate of soda per apple tree a month before the trees bloomed, in soil lacking in humus and nitrogen, there was 166 per cent. more fruit set than on trees which received none. Just how the nitrate of soda caused the fruit to set is not clear. It dissolves rapidly and the trees would, no doubt, be taking up the nitrogen by the time the fruit was setting, when, perhaps, the extra vigor of growth caused by the nitrogen would cause a quicker flow of sap which would better ensure the young fruit getting an adequate supply.

Injurious Insects and Disease. I shall refrain from saying much about the loss of crop by fruit not setting due to Apple Scab and other diseases and insects. The loss is, doubtless, very heavy, particularly in some seasons.

Thinning and Pruning. So far as I have been able to find, no marked difference in the crop has been obtained by thinning or methods of pruning in previous years, although these, no doubt, have some influence.

Spray Injury. Drenching the trees with very strong or improperly made spray mixtures may cause such injury that the fruit will not set well. It is desirable to use the materials and formulas which have been well tested and found satisfactory.

Results at Ottawa: At the Experimental Farm at Ottawa records have been kept of the yields in gallons of each individual tree in the orchards since 1898, or for 19 consecutive seasons. The time when each tree began to bloom, was in full bloom, and when the bloom fell, has been recorded every year since 1899. The amount of bloom, whether small, medium or large has been recorded every year since 1899. The temperature records have been kept since that time and also the daily sunshine records and rainfall so that we have an abundance of data on which to base the cause of the large proportion of good crops which have been obtained. The trees have been thoroughly sprayed every year since that time and they have never suffered to any great extent from either injurious insects or disease until 1916, when in the early part of the season the scab on the foliage was very bad, and what is quite unusual with us, there was some scab on the fruit of some varieties as well. In the 18 seasons from 1899 to 1916, inclusive, there has been a relatively light crop of some varieties every alternate year, there being one exception in the year 1905; thus certain varieties bore light crops in the years 1899, 1901, 1903, 1907, 1909, 1911, 1913, and 1915 while medium to good crops were produced in the other years. This would seem to prove that most varieties are alternate bearers, but on consulting our weather records, there appears to be good reason for the light crops in most of the years. Thus in 1899 the maximum temperatures ranged between 58 degrees and 61 degrees when the flowers were opening and it rained on four consecutive days. In 1901 the maximum temperatures were below 60, and it remained at that on four consecutive days during the blooming period. In 1903 the weather was excessively hot during the blooming time, the temperatures ranging from 82 to 91 on six consecutive days and the ground was very dry. The exception to the regularly alternate off year came in 1905 when there was a good crop generally, but we found that the maximum temperatures ranged between 70

degrees and 80 degrees most of the time, being quite favorable for pollination. The year 1907, the bloom was very late and the maximum temperatures ranged from 57 degrees to 67 degrees in the first and second weeks of June when the trees were in bloom and beginning in May and ending June 10 there were sixteen consecutive days when it either rained or was cloudy. In 1909 while the maximum temperatures were above seventy most of the blooming season, and the weather clear, the blooming season was late and weather was unfavorable for growth in June which may have prevented the fruit from developing. In 1911 it was very hot and dry in the blooming season, maximum records on successive days beginning May 18 being 86, 82, 92, 94, 94, and 87 degrees. This exceedingly hot dry weather is not, we believe, favorable to good pollination. It was an early blooming season in 1913 but when the flowers began to open the temperature fell and between May 8 and May 22, when most of the bloom was, there were nine days when it was below sixty and frost was recorded on four nights.

In 1915 the maximum temperatures ranged from 49 to 67 degrees on four days it was below 60; once it went up to 77 during the blooming period. Frost was recorded on one night. This was an unfavorable season for the setting of fruit in many places in Ontario.

The years 1900, 1902, 1904, 1905, 1906, 1908, 1910, 1912, 1914 and 1916 were all favorable for the setting of fruit, the temperature being sufficiently high but not exceptionally high and the weather being clear most of the time.

It will be seen that the alternate bearing which at first glance might be thought was due entirely to heredity or constitution is really a coincidence and that it is caused mainly by the approximate alternate favorable and unfavorable weather conditions at blooming time or possibly during the previous winter. It is true that the bloom has not been so heavy in these off years, but there is usually some blooms and in a season favorable for pollination fair crops have been obtained when the bloom was relatively light.

As bearing out our records in regard to the influence of the season on the size of the crop, let me quote the summary of observations made at the Woburn Fruit Experiment Station in England:

"The view that fruit trees tend to bear heavily and lightly in alternate seasons is often made the basis of a recommendation to thin a heavy crop borne one year, in order to obtain a better crop the succeeding year. It appears, however, that the tendency towards alternate cropping, as it may be called, is very feeble, and that there is, at the same time, an equally potent tendency towards consecutive cropping, that is, that a tree bearing particularly well or badly during one season will probably do the same in the succeeding season, whilst the chief factor in determining good or poor bearing is undoubtedly the atmospheric conditions and not any innate tendency of the individual tree to either alternate or consecutive fruiting.

"In another case of apple trees where observations apply to over 5,700 instances extending from 1904 to 1915 the tendency has been, with only one slight exception, towards consecutive bearing. But this tendency affects the results to only a slight extent, about 12 per cent., the remaining 88 per cent. being attributed to peculiarities of the season, and not to the individual behavior of the trees." Further—"The alternation of good and bad years has been uniformly exhibited to a most marked extent in some plantations available for observation over a period of 20 years. As the injury to these crops has nearly always been due to spring frosts, it is evident that the alternation of good and bad years is due to the tendency of such frosts to occur alternatively in consecutive seasons."

The Baldwin apple has the reputation of being an alternate bearer, yet Geo. T. Powell, a veteran fruit grower and experimenter in New York, states that he gets annual crops if the soil is good and there is abundance of moisture. He also thins the heavy crop in order to get a good development of fruit buds for the next year's crop. In a recent letter he states: "I have Baldwin and Sutton trees that are heavily pruned and thinned that give regular annual crops." Thus showing that if weather conditions are favorable and cultural conditions good, the tendency is for even Baldwins to bear annually.

Cause of Good Crops at Ottawa. Someone may now wonder, if there has been an unfavorable spring every other year at Ottawa, why good crops have been obtained fairly regularly from some varieties. We believe it to be due to the fact that a large proportion of the varieties now growing at Ottawa are very hardy, and the flowers are able to withstand adverse climatic conditions better than the more tender sorts. Take the following yields in gallons for instance of individual trees, which if divided by 24, will give about the number of barrels each year.

Duchess of Oldenburg, planted in 1888: Following are the yields from a certain tree for the years 1902-16, consecutively, in gallons—63½, 47, 89, 70, 111½, 68, 100, 52½, 111½, 93, 149, 49, 132, 69, 132½, an average of 89 gallons or 3¾ barrels per year for 15 consecutive years.

McMahon White, planted in 1888, beginning in 1902: 69½, 43, 72, 96, 75, 52, 81, 78, 97, 94, 50, 74, 143, 109, 136, an average of 85 gallons or 3½ barrels per year for 15 consecutive years.

Charlamoff, planted in 1888, beginning in 1902: 66, 6, 106½, 33, 81, 33, 103, 38, 97½, 15, 108½, 25, 133, 22½, 123½, an average of 66 gallons or 2¾ barrels per year for 15 consecutive years, the lighter crops being in the unfavorable seasons.

Antonovka, one of the hardiest Russian apples and one that is most extensively grown in the colder parts of Russia, has made a good record. Planted in 1888, the yields from 1902 are: 57, 7, 88, 68, 105, 84½, 84, 77, 112, 65 113 (it had a large crop the next year, 1913, but the yield was not recorded), 152, 116½, 93, an average for the 14 years of 87 gallons or 3⅝ barrels per year.

McIntosh, planted in 1890: The yields from 1902 are, 71½, 94, 12, 109, 3, 109, 41½, 184, 50, 166, 55, 145, 112, 44, 149½, an average of 90 gallons or 3¾ barrels per year.

Wealthy, planted in 1888. The yields from 1902 are: 21½, 35½, 60, 60, 65½, 33, 69½, 12½, 62½, 15½, 93½, 12, 114, 24, 124, an average of 54 gallons or 2¼ barrels per year.

All of the trees of the above mentioned varieties did not yield as good crops as regularly as those given above, but these and others are the varieties which assured us good crops in bad seasons.

There are undoubtedly some varieties of apples which bear in alternate years, and which have no flowers in the off year. Tetofsky is one of these, there being an off year regularly, alternately from 1899 to 1916, except in one off year when there was a slight amount of bloom. The Tetofsky goes very much to spurs and bears very heavily in alternate years.

From the foregoing data and other information, we make the following recommendation for obtaining the maximum number of good crops:

For the man who intends planting an orchard, we advise planting on a slope where there will be a good circulation of air, avoiding pockets and flat land where

frost will settle. In blooming time the temperature on the slope may be 9 to 10 degrees higher than that on the level, and even if there is no frost the temperature on the level may not be high enough to ensure a good germination of pollen and fertilization.

Plant at least some of the hardiest varieties of apples so that these may be depended upon in unfavorable seasons to give a medium to good crop.

Plant varieties which have the same blooming season alternately, say two rows of one and four of another.

Keep bees to aid in pollination so that the greatest advantage may be obtained from a short favorable period in a generally unfavorable blooming season.

When trees are old enough to begin to crowd, prune severely to admit sunlight and air or take out some trees altogether.

Spray thoroughly every year to reduce to a minimum the loss from injurious insects and fungus diseases and ensure good foliage and a good development of fruit buds.

Begin to cultivate as early in the spring as possible to conserve moisture where there is any danger of too little moisture in a dry time.

Keep up the fertility of the soil. Trees with insufficient available plant food will not set as much fruit as those with a regular and good supply.

REPORT OF THE RESOLUTIONS COMMITTEE.

The following resolutions were presented at the Convention and received its approval:

1. Resolved, that we desire to place on record our deep sense of the loss sustained during the past year in the sudden and unexpected death of the late Dr. C. C. James, Commissioner of Agriculture for the Dominion of Canada. Dr. James was perhaps the most outstanding figure in Canadian agriculture, a cultured gentleman and one deeply interested in all progressive movements in the Dominion for the furtherance of the well-being of the people at large. He has been removed by Divine Providence in the prime of life, and on the threshold of what promised to be a career of unexampled usefulness to the Canadian public.

As fruit growers we will cherish in our hearts the wise counsels and active interest he took for many years in the fruit industry of Canada.

We extend to his family our sincere sympathy.

2. Resolved, that it is with sorrow that we have also to record the sudden and unexpected removal by death during the recent weeks of the Hon. James Duff, Minister of Agriculture for this Province. Hon. Mr. Duff was a worthy successor to the Hon. Mr. Monteith, and during the years in which he occupied the honorable position of Minister of Agriculture, he closely identified himself with all movements for real progress in his Department. A good friend and a noble man has passed away, and a vacancy has been left that will be very difficult to fill. Our sympathies go out to his bereaved family.

3. Resolved, that this Association once more place on record its appreciation and recognition of the very valuable services that have been rendered the fruit growing interests of the Province by the transportation agent of the Association, Mr. Geo. McIntosh, a work which has resulted in the saving of many thousands of dollars to the fruit growers of Ontario, and we express the hope that this work shall be continued.

4. Resolved, that, whereas the Ontario Fruit Growers' Association exists for the one purpose of promoting the best interests of the fruit growers of the Province, and whereas the power and influence of the Association is in a very real degree determined by the extent of the membership of this Association, we would urge our brother fruit growers who have not already done so, to identify themselves with this organization, and to lead others to do so and especially to use their influence with ours to show the members of the local fruit growers' associations how important it is in the interests of the fruit industry that they shall affiliate themselves with the Ontario Fruit Growers' Association.

5. Resolved, that, whereas the best interests of the fruit growing industry and of the people of Canada is being endangered by the embargo which has been placed by the railways upon the transportation of spraying material, spraying equipment, fertilizers and seeds, and whereas the Dominion and Provincial Governments are urging in the interests of the Empire the importance of increased national production, be it resolved that we believe that it is necessary that this embargo shall be removed speedily, and we would request that a copy of this resolution shall be forwarded to the Minister of Agriculture for the Dominion and the Chairman of the Dominion Board of Railway Commissioners and the railroad companies, with the request that action be taken in reference to it immediately.

6. Resolved, that in view of the excellent success of the efforts of our transportation expert in a Provincial sphere, the Minister of Agriculture at Ottawa be petitioned to appoint an official in connection with the Department of the Dominion Fruit Commissioner to work in the interests of fruit growers throughout the entire Dominion, the work so far accomplished by this Association having demonstrated that such an official would be able to render valuable assistance to the efforts of our Provincial Association.

7. Resolved, that in view of the immense damage which now threatens this Province from the recently introduced disease known as the White Pine Blister Rust, this Association earnestly urges both the Federal and Provincial Governments to take immediate and adequate steps to eradicate or control this dangerous pest, and that a copy of this resolution be forwarded to the proper authorities.

SWEET CHERRIES.

G. A. Robertson, St. Catharines.

The cherry seems to be pretty well distributed over the different parts of the Continents, but the sweet cherry (*Prunus avium*) from which we derive our better known varieties, is supposed to have come from the Mediterranean to England, from whence we get the name "English Cherry."

From England it was taken to the United States, and in no small degree was the means of bringing into prominence one of the many sterling qualities of one of their former Presidents, George Washington.

This species, *Prunus avium*, is divided into the following: —

The Hearts: These are heart-shaped cherries with soft flesh, and juicy; and include such varieties as the Black Tartarian, and Governor Wood.

The Bigarreaus: Which are also heart-shaped, but with firm, crisp and crackling flesh, and includes such varieties as Napoleon, Windsor and Elkhorn.

The Dukes: These are supposed to be crossed with the sour cherry (*Prunus cerasus*) by some, while others say they are from the *Prunus avium* alone, they are upright growers usually reddish in color and acid in flavor, and include such varieties as May Duke and Late Duke. The last class includes the Mazzard, on which many cultivated varieties are budded, and which is used principally for root stock.

From the time of planting the trees, the one object to be kept in view is the annual production of the maximum crop of the highest quality of marketable fruit.

This can be done only by overcoming the chief causes which work against the attainment of this object, which are:—

1. The improper location of the orchard.
2. The choice of unproductive varieties.
3. The use of improper nursery stock.
4. Improper methods of pruning.
5. Lack of necessary spraying to overcome insect and fungous diseases, which attack the trees and fruit.
6. Lack of care in harvesting; which includes the marketing of immature fruit, the breaking of the fruit spurs from the trees by careless picking, the picking of the fruit without the stems.
7. The lack of the necessary amount of plant food in the soil.

For it is only by the overcoming of all these, that one is able to get the best results.

Sweet cherries are yearly increasing in popular favor; and this popular favor will increase or diminish, only as the product put on the market is good, thereby increasing the demand; or poor, thereby decreasing the consumption. Not many years ago the sweet and so-called sour varieties were marketed at practically the same price per basket; the sweets are much more difficult to produce, and to market than the common or sour varieties, and an impetus was given to planting the sour cherry at the expense of the sweet. Since then the sour cherries have decreased steadily in price, and the sweets have increased, until now a sweet cherry orchard in full bearing is a decided asset to any farm.

Location. Sweet cherries should be planted on a deep, dry, well drained soil. No other tree fruit will respond any better to good treatment but planting on an unsuitable soil is disastrous, and a wet subsoil will prove fatal. Therefore, when chosing a location, a high dry sandy or gravelly knoll is best, and a proper system of underdrainage will prove beneficial. Close proximity to a town where a requisite number of good pickers may be had, and frequent and rapid shipping facilities is desirable.

Sweet cherries bloom very early, varying in the last few years from say as early as the 23rd of April, and sometimes as late as the 10th of May, most of our popular varieties bloom heavily and set freely; when in full bloom, a few hours of hot sunshine assisted by the presence of myriads of bees will set a fair crop, this may be followed by a week or ten days of cold wet weather, with perhaps a few degrees of frost; but if properly set the calyx of the blossom forms a little blanket to protect the tender fruit, and this drops only as the cherry swells, or as the stem of the improperly fertilized fruit shrivels and drops; hence planting an orchard near a body of water which will modify the temperature, will often insure a crop when a few miles inland, the few degrees difference in temperature, may shorten it materially, if not destroy it entirely for the season.

Varieties. In choosing the varieties from a commercial standpoint, annual

bearing is the most desirable, and coupled with that, a fruit that is good size, color and flavor, and also good in shipping quality. The tree should be a rapid grower, strong and hardy. The varieties that so far I have tried that conform to this standard named in the order of ripening are: Black Tartarian, Napoleon, Elkhorn, and Windsor. I have also fruited Lambert which ripens after Windsor, and is promising, being of good size and flavor. I may also add Bing. Both of these are grown in the west, the latter ripening about the same time as Elkhorn, and is an excellently flavored cherry.

Nursery Stock. Our future orchard should consist of trees procured from some honest, reliable nurseryman or grower. The first precaution is to be sure that they are true to name, and then it is necessary to see that they are grown on the Mazzard or sweet root stock. Unfortunately too many of our Canadian nurserymen use the Mahaleb stock, this is easier to grow in the nursery, but when planted in the orchard it makes a short-lived tree, as the butt of the sweet stock outgrows in diameter the Mahaleb root, the first noticeable effect is that some of the limbs on one side of the tree, lack vigor, and finally die; this is followed by a rapid decline of the tree, and often a fungus breaks out at the surface of the ground where the root joins with the butt.

I may also add that in cherries as well as other fruits, the attention of careful bud selection is an item which has not been given due consideration. In California the failure of some of the lemon groves to produce remunerative crops has been investigated, and the shortage in the crop is attributed to no other cause than the indiscriminate gathering of the buds used by the nurseryman: the prolific tree being as a rule not a tree where there is a superabundance of buds suitable for propagation, the nurseryman taking the buds from those of the same variety, but one which has a disposition to form a shade tree rather than one with heavy fruiting qualities.

Planting. In starting an orchard, a serious mistake is often made by not giving the trees sufficient room. Sour cherries do well when planted twenty by twenty feet apart. Sweet cherries should have at least a distance of twenty-five by twenty-five, and the more spreading thirty by thirty feet. In my newer plantations, I stake the orchard at twenty by twenty feet, and then start planting alternately each way, a cherry and a peach. This makes the cherries about twenty-eight and a half feet apart diagonally, the peach coming into bearing more rapidly, and being shorter lived is used as a filler, and must be pulled out so as not to interfere with the cherries, which should not usually occur until after the trees have reached the age of ten or more years.

The nursery stock as procured from the nursery should be one or two years old from the time of budding. The former is usually a straight upright growth, usually called a "whip," while the two-year-old is branched.

From past experience, fall planting of sweet cherries is most desirable for the Niagara District. One can get a better headed tree, as the buds are dormant, and the roots become firmly settled in the ground; and an early start in the spring is essential. If spring planting is followed, they should be planted as early as the ground is suitable, as the buds usually swell very early, and many get rubbed off even with the most careful handling. After planting do not prune back too much; the terminal bud is the one where the growth starts most readily, and then the several buds surrounding the terminal bud. I prefer to have the trees headed not lower than three feet from the ground and three feet six inches is better for the more spreading varieties.

If you have a two-year-old tree, it will likely have a head formed, and if it is the proper height you may cut out the vertical growth of the terminal bud in the centre formed the preceding year, but do not shorten in the laterals if the tree has been fall planted, for top and root growth develop simultaneously, and if you cut off the one you retard the other, and from actual test at the Vineland Experimental Farm, the losses from the shortened in trees were fifty per cent. greater than those left unshortened.

My preference is to have a tree forked with three branches spaced evenly, and if you have such do not under any consideration cut it back. There is a common belief that a heavily pruned tree grows faster than an unpruned tree, and many prune heavily to "force wood growth." If you wish a tree to increase in size just let it grow. If you wish a strongly forked tree leave the branches which form first from the main shoot. The fast growing branch is erroneously called a strong growth, whereas in reality the heavy growing upright branches are not the strongest growing, and the more rapid and upright growth stimulated by excessive pruning while forming the head of the tree is a source of weakness and trouble later on.

General Care. After planting in the fall it is a good practice to plow up to the young trees, or throw the earth around them with a spade so that there will be no hollow for the water to lie around the tree. This is removed in the spring and if the tree be a yearling the lower buds on the newly planted tree may be rubbed off to the desired height as they begin to swell. The young trees should be sprayed with concentrated lime and sulphur at the winter strength just as the buds are ready to burst, and they are benefited by a spraying or two with the summer strength of lime and sulphur with arsenate of lead added about the first of June, and again the middle of the same month. Hoed crops may be grown between the trees for the first five years, and the necessary cultivation and manures necessary for these crops will benefit the cherries. After this time the trees will require most of the space. Then they should be given clean cultivation until July. The earth may then be thrown up to the trees, and the land seeded down until the following spring, when the same process is repeated. The future pruning of the tree is not a very serious problem. It consists of the pruning out of some of the unnecessary branches that form in the centre of the tree, and trying to allow the tree to take on a natural rather than a forced wood growth, and not allowing the one side of the tree to grow at the expense of the other. If it is necessary to remove rather much wood from the centre of the tree, a modified system of summer pruning may be adopted. This is best done about the middle of July. It has a tendency to check wood growth and cause the formation of fruit spurs. As the trees start to bear the fruiting will retard the excessive wood growth, and the manure may be applied more liberally. When the trees are in full bearing, liberal application of barnyard manure may be applied in the winter, with the addition of about four hundred pounds of bone meal in the spring, and about two hundred pounds of nitrate of potash per acre, clean cultivation until picking time; then seeding down in July.

Fungous Diseases and Insect Pests. In former years before spraying became general, perhaps one of the most serious pests of the Sweet Cherry was the so-called Leaf Blight or Shot-Hole fungus (*Cylindrosporium spadi*). Early in the summer the leaves became more or less affected with little brown spots, these spots in time broke away leaving the little perforations in the leaf, hence the name "Shot-Hole Fungus." This frequently became so serious that whole

trees became defoliated during midsummer; since spraying has become general this is not a serious disease, although we not infrequently see a branch or even a whole tree more or less affected.

The most serious of all the pests to cope with is the Brown-Rot (*Sclerotinia cinerea*). It is on account of this one fungus that there are so few sweet cherries grown in this section of the country, and if one does not make every effort to overcome this disease he might better go out of business. If the weather is hot and dry from the time of blossoming to the time of ripening, we have little or no trouble with the "rot." Then again a season comes when the weather is hot and sultry, and the fruit may be apparently sound and all right at night, while the following morning it may be rotten and not worth picking, so serious does this pest become. Spraying, which seems to control it one season, apparently has little or no effect another season; hence the only way to combat this disease is to surround the tree with those conditions which do not favor the development of the disease. I touched before on the advisability of setting out the trees at a good distance apart, heading them well up from the ground, also allowing the branches to grow in as nearly a horizontal position as possible, of not allowing more than three main branches, and adopting a modified system of summer pruning to keep the centre of the tree open and avoid the excessive upward wood growth and consequent shade, and to these we add the removal of all wind-breaks which would retard a free circulation of air.

The best fungicide is free access of air and sunlight. The next best fungicide is a liberal use of arsenate of lead to prevent the insects from puncturing the fruits, for if these are kept unblemished and the moisture dried up from them, the battle is half won, as the fungi develop most readily from insect stings, or where the fruits hang in clusters surrounded by dampness. When spraying we find it best to spray both sides of the tree thoroughly before the blossoms burst, trying to do the second side of the tree just after the buds burst and before the blossoms open, just as they are commencing to show their white color, both sprayings with the full strength winter spray, lime and sulphur, of the specific gravity 1.03. (This also helps keep the cherry aphis in check.) Then after the fruit develops, and the little coverings commence to fall, we give the second spray one gallon of the concentrated to 40 gallons of water, to which is added three pounds of arsenate of lead. Then we repeat in ten days, with the same mixture. The second of these sprays will prevent the stinging of the young fruits by the "Plum Curculio" (*Conotrachelus nenuphar*), which deposits its egg by stinging the fruit while very small and cutting a little semi-circular mark around the puncture to prevent the growth of the young fruit from destroying the young larva. The third spray also helps to prevent the rot by preventing the development of the Cherry Flies, *Rhagoletis cingulata* and *R. fausta*, two little flies similar to the common house-fly but smaller. These emerge about the time of the first reddening of the Early Richmond sour Cherries, and fly about for several days feeding on sweet substances before they sting the late varieties of fruit. Perhaps to this, emphasis should be put on the necessity of watching the cherries during catchy weather, and marketing them as soon as they are fit, but not before. To do this they must have an even ripeness and good color. Color comes by the action of sunlight, and cherries bring the top price only when they are the best quality.

I will not touch on the San José Scale (*Aspidiotus perniciosus*), which has no footing in a properly conducted orchard, as the winter spray of lime sulphur controls this.

HARVESTING. The harvesting of the cherry crop is given altogether too little attention by the average grower. We may take every care to have the trees grow right, to thin out the branches, and keep the fruit sound and clean; and then allow the pickers in the orchard. The first thing to watch is that, while harvesting the fruit, they do not break the fruit spurs on which the fruit hangs and grows each year. It is an easy matter by a careful examination of the spurs to read the history of the tree and count the former crops. Yet, if you allow a lot of careless or thoughtless pickers to have their way, the surface of the ground will seem to have more leaves on than the tree; and in a few years the limbs will become denuded of fruit spurs, bearing almost all of their fruit on the terminal branches, the intervening parts being almost bare. To overcome this, many of the growers in the west clip the cherries with the aid of scissors. It is not a difficult thing for a picker to harvest the cherries properly provided they are reasonably mature.

Then again we find the other extreme, that of picking without stems. This may be done if the fruit is delivered immediately to a nearby canning factory for present use, but even then it is questionable if in the case of large white cherries this should be allowed, for if they are put up in glass every little bruise shows. When cherries are shipped this practice should never be followed. A few years ago I went over to the Toronto fruit market and saw some No. 1 common red cherries selling for $1.25 per 11 quart basket. I also saw a lot of equally good fruit they were asking 50 cents for an 11 quart basket, and the salesman said they would likely have to take much less. The only difference was that one was picked carefully and with the stems on, and possibly contained about 15 lbs. net weight of cherries, sound and dry; the other contained possibly 17 or 18 lbs. net of cherries, picked with the stems off, at present apparently sound, but wet and sticky. The juice was running so that the veneer of the basket was quite wet; if these were not sold until the following day, the former would be all right while the latter would likely contain very few sound cherries, and would likely sell for about ten cents per basket. We shall figure the net cost and the balance left in each case from the time the cherries hung on the tree until they were sold by the wholesaler in Toronto. Taking 10 per cent. for selling, 1 cent for cartage, 4 cents for freight, 20 cents for picking, 5 cents for sorting, 5 cents for the basket, 5 cents for overhead expenses in the orchard, and 1 cent for delivery at the point of shipment, leaves in the first case for the properly picked cherries 71.5 cents per basket. In the case of the second lot we shall not deduct the 5 cents for sorting and still we have 13.5 cents left; or in the one case 4.7 cents per pound, and in the other case about .8 cents per pound, or about six times as much for the one as the other, and when we consider that from this net price we still deduct the cost of the care of the orchard, including pruning, manuring, three sprayings, the cost of the ladders used in picking and their upkeep, the rent of the land, taxes, and depreciation in the orchard, to say nothing of the cultivation, we are reminded that the old adage, "Whatever is worth doing is worth doing well, surely applies to Sweet Cherry growing.

I will not mention packages, as certain markets demand certain styles of packages; but will say that good fruit sells on appearance, and should never be put up in a rough slipshod or untidy manner, and that cherries carry better if the package is not too bulky.

PROF. CROW: I was interested in Mr. Robertson's remarks on pruning, and I would like to compliment him on the accuracy of his observations, but I am afraid

it is going to go abroad from this Convention that we are over-doing the pruning business, and I would consider it a mistake to have an impression of that kind created. I am afraid a wrong impression has been created. I would like to say that the idea of leaving young trees to grow for three or four years without pruning is all right with a great many varieties, but it is principally a question of variety. There are varieties of apples and pears that do not require very much pruning. They grow about the right shape if you leave them alone; but there are others that certainly require pruning and correction. There are varieties of the Northern Spy and the upright growing varieties of pears which are very late in coming into bearing, and I think it would be a mistake for anybody to come to the conclusion that a Spy tree should be left unpruned until it is ready to bear. If you leave it alone you will certainly have to wait a long time. I certainly think that the Spy or any other upright growing variety of apple or pear should be pruned from the start. Do not head back, but take out all the surplus branches, and I guarantee you will bring that tree into bearing sooner. It stands to reason it can be done, and I would like to correct any false impression that has been created here in that regard.

THE CHAIRMAN: It has been said that we have been pruning our young trees too much. Now do not let us swing the other way and not prune them at all. That is what Prof. Crow wants to impress upon us, and I think he is perfectly right.

THE WHITE PINE BLISTER RUST IN CANADA.

W. A. McCUBBIN, M.A., DOMINION FIELD LABORATORY OF PLANT PATHOLOGY, ST. CATHARINES.

Owing to the ease with which articles of all kinds are now transported by land and sea, there has grown up in recent years a wide interchange in all sorts of commodities between different countries and between far distant continents. Among these innumerable articles of exchange are to be found a goodly number of plants or parts of plants, so that there is hardly an ocean-going vessel which does not carry in its hold seeds, bulbs, cuttings or seedlings destined for the use or pleasure of other lands and other peoples.

INTRODUCTION OF FOREIGN DISEASES.

That these importations are valuable additions to the field, garden and orchard inhabitants of their new homes cannot be doubted; but they are not in all cases an unmixed blessing. It is a matter of common knowledge that these imported plants sometimes bring in with them very undesirable foreign diseases which thus get free transportation to a new field of activity where they may spread and become very destructive. As instances of this disease introduction there may be mentioned the American Gooseberry Mildew, which we bestowed upon Europe through the medium of young gooseberry plants which were taken over from our side of the world. The Grape Mildew was carried over to France in a similar way on grape seedling stock; while the Chestnut Blight which now promises to wipe out the valuable chestnut forests of the United States is reputed to have been brought in from China on imported chestnuts.

In the last few years, we in Canada, narrowly escaped the curse of a serious potato disease, the potato canker, and it was only by the energetic action on the part of the Federal authorities that the danger was averted.

It is to be noted that this problem of disease introduction is rendered much more complicated by the difficulty of foreseeing how virulent any given plant disease will become when introduced into a new environment, where it is allowed to attack a number of new species which not inured have not by ages of continued exposure developed resistant qualities, as have the ordinary hosts in its home land. In several cases it has happened that a disease which was considered comparatively harmless in its native place becomes exceedingly destructive when it is established elsewhere. The Grape Mildew, already mentioned, is a striking example of this erratic behavior. This mildew was of little importance on the native American grapes, but in the few years following its introduction into Europe, about 1875, it became so destructive that the grape industry of France was almost wiped out before spraying methods were devised to control it.

The necessity of guarding against these "Greek gifts" from abroad has long been apparent and nearly all progressive countries now have in operation stringent quarantine regulations which either prohibit foreign plants from being imported or allow their importation only after the most rigid inspection. The inadequacy of the existing regulations in America has been apparent in a large number of cases in recent years and the tendency in future will doubtless be to build the barriers against foreign plants much higher than they have been heretofore. It has been found out by dearly-bought experience that the loss caused by one single disease will pay many times over for the cost of enforcing an efficient quarantine.

Description of Blister Rust.

Europe has recently added another unwelcome contribution to the plant disease of North America, viz., The White Pine Blister Rust. (*Perid. str. kl.*)

Life History of the Disease on the Pine.—As the common name indicates, it is chiefly noted as a fungus parasite of the white pine (*Pinus Strobus L.*), but it can also attack several other species of pines, viz.: *P. Cembra*, *P. monticola*, *P. excelsa*, and *P. Lambertiana*, and perhaps any or all of the thirteen species of five-leaved pines. It may be noted in passing that the five-leaved pines alone are susceptible and that the two or three-leaved species, including the Austrian Pine, the Scotch Pine, and the Jack Pine of our northern forests, are not subject to the disease.

The most serious phase of injury on the white pine occurs in the seedling stage on young trees or on comparatively young shoots and limbs. Extended observations in the Niagara district in 1916 have established that although the fungus may enter the limbs through wounds in the bark the great majority of infections occur by way of the leaf shoots. From the point of entry the fungus grows up, down and around the branch in the soft bark. If the shoot is weakly the invaded tissue is killed and a dead area appears in the bark. If the shoot is vigorous and healthy, however, a growth stimulation is set up and the limb becomes swollen and puffed and this swelling often takes on a sickly yellowish appearance.

From such swellings there arise in spring from April to the middle of June the characteristic "blisters" which have given the disease its name. These blisters are about the size of a match head or larger and are of a pale orange or whitish color. In age they fade to white. Each blister has a delicate covering which encloses countless orange-colored spores within. In a short time the covering breaks and the dust-like spores are carried away by the wind leaving only ragged remnants of the blister coat behind. Even these white delicate remnants soon disappear and for the rest of the summer the infection shows only the slit-like

cavities where the blisters were formed, or swelling and discoloration further down the limb where the fungus has advanced into adjacent parts.

The time which elapses between the infection of a pine and the formation of spores varies somewhat from three to six years or more, but according to evidence collected from 1,700 cases the usual period appears to be about three and one-half years: that is, an infection started in September, 1912, would normally produce blisters in May, 1916. No more blisters are produced afterward at this same point, but a fresh series of blisters arises next season from the parts next the old blister area. The year after others appear beyond this part again, and this annual succession of blisters continues as the fungus creeps down the limb until the tree dies.

It is seen from the above that the course of the disease on pines is very slow. It takes a long time to kill a large tree and this can only be accomplished by a number of infections working in different limbs. Small trees, however, are girdled and killed very readily, and as they seem to be especially susceptible to attack it is evident that in or near an affected grove the seedlings on which future forests depend would have little chance of surviving.

The Disease on Currants.

Like many other rusts this fungus passes part of its life on another host—the currant, or to speak more correctly, on all species of the genus Ribes. Of these species, which include all the wild and cultivated currants and gooseberries, the common garden black currant is by far the most susceptible. On the red and white varieties, on gooseberries, and on wild currants comparatively little damage is done, but black currants suffer so severely at times that the disease promises to become quite a serious pest in black currant plantations. Not only is the food producing power of the leaves greatly reduced by the presence of the rust but in the more severe cases the leaves fall long before their time. In such cases the buds which ought to remain dormant over winter may start into growth in fall, thus producing a secondary set of leaves. As these are always killed by winter and the shoots lose the stored food which was used up in their formation, the damage to such plants is very considerable.

The spores shed by the blisters on the pine in the spring are not known to be capable of infecting other pines again, but they readily infect near by currants. The leaves *only* of the current plant are attacked, and ten to fifteen days after infection they appear on the under sides of these leaves small pustules of a brilliant orange color, and filled with orange spores. These spores in their turn are carried by the wind to other currant leaves, and thus the currant infection is spread throughout the summer. So rapid is the spread of the disease by means of these spores that where currant plantations are numerous in a district all the black currants for several miles around the infected pine may be rusted before the end of summer. Although the spores produced in the early part of summer on currant leaves are incapable of reinfecting pines, yet towards the close of the season the pustules put out small orange finger-like growths on which spores are formed that are able to infect pines again; and since, as noted above, the rust may spread on currants for several miles, there is every danger that a new lot of pines may be infected a long distance away from the original pine from which the currants received their infection in the spring.

Until lately it has been considered that the rust died out every winter in the currants, and had to be renewed each spring by infection starting from some

diseased pine. During 1916, however, a great deal of evidence has been collected in the Niagara Peninsula, which indicates very strongly that the fungus may be able to pass the winter in the currants themselves, and that once started in a district it may go on from year to year even if the pines are destroyed. This point is of extreme importance in the question of control.

Summary of the Life History.

We may sum up the main features in the life-history of the disease as follows:

A. On the Pine.

1. Lives on five-leaved pines only.
2. Produces swollen discolored areas on the limbs.
3. Spore filled blisters arise from these swellings in early spring.
4. The spores infect nearby currants, but not pines again.
5. Seedling trees are girdled and killed rapidly, adult trees damaged more slowly.

B. On Currants.

1. On all wild and cultivated currants and gooseberries; black currants particularly susceptible.
2. Leaves only affected; few or many small orange rust pustules are formed on the under sides of the leaves.
3. Spores from these pustules spread the disease during the summer to other currants (but not to pines).
4. In fall spores capable of infecting pines appear on the leaves.
5. Rust mostly dies out each winter on currants but may live over to start the disease in spring again under exceptional conditions.

Origin of the Disease.

This fungus has been known in Europe for many years, but appeared to have done little damage to native European pines. As soon, however, as our North American white pine was introduced into European forest nurseries, this rust found it a very susceptible host, and attacked it so severely that a great deal of damage resulted. It was on nursery seedlings of white pine that the disease found its way to our continent. Owing to cheap labor in Europe these pines could be grown there, shipped here, and sold to us at a price lower than the cost of raising them here. A considerable trade of this nature sprang up, and several millions of these seedling white pine were imported into the United States and Canada from France, Holland, Belgium and Germany. The greater part of these importations took place in 1906-7-8, and in these years if not earlier the rust disease came in unnoticed on these young pines and established itself on our continent. As soon as the disease was discovered further importations were discontinued and the authorities set themselves to the task of eradicating the pest.

The Situation in the United States.

The disease was first discovered in New York State in 1909, and later on in 1910 other centres were located in several other States.

It was then seen that the disease was more widely spread than had been suspected, and during the last three years special efforts have been made to locate all the centres of infection and destroy the infected pines. The present situation there is not very promising, the disease having now become so generally established in the north-eastern states that its total eradication can hardly be hoped for.

The Situation in Canada.

The disease was first discovered in Canada in the fall of 1914, at the Ontario Agricultural College, Guelph, and a hurried and very limited survey during the remainder of the season showed that it was general in the Niagara Peninsula on currants. More extended surveys in 1915 and 1916 show that in addition to the large area of infection in the peninsula, there are a number of small isolated cases at Guelph, Brantford, Port Burwell, Dutton, Oakville, Cookstown, Lindsay, Bowmanville and Ottawa. While only two places in Quebec are at present known to be infected, Oka and St. Anne de Bellevue, it is probable that surveys in that Province will show a much more extensive occurrence of the disease.

The Problem of Control.

What can we do with this disease? Is it still possible to entirely eradicate it from the continent or will it continue to spread despite all our efforts? Failing complete eradication, will it be possible to keep the disease from the large areas specially adapted to pine growing in the north of the province? Even if this could be done, can a control method be worked out whereby the pine areas which will inevitably be planted out in future days may be kept free from the disease at a cost which will still leave the matured forest commercially profitable?

The problem is a difficult one to solve. Fortunately there is now no danger of fresh importations of the disease from Europe since both Canada and the United States have already in force regulations absolutely prohibiting the entrance of European five-leaved pines; we are, therefore, concerned only with the already established areas of infection. Until recently it was thought that the problem of eradication could be solved very simply by destroying one of the host plants in a district. This method was based on the generally accepted belief that the currant stage dies out each winter, and must be started again each spring from some affected pine nearby, so that if the affected pines, or to make sure, all pines in the neighborhood, were destroyed the disease would be obliterated. Unfortunately the evidence already mentioned indicates very strongly that the disease may pass the winter on the currant and that the removal of affected pines will not prevent the continuance of the disease on currants from year to year. On the other hand the removal of currants from the neighborhood of diseased pines would also appear to be effective in stopping the spread of the disease. This is undoubtedly true, but in the areas where this method has been tried it is found to be both costly and uncertain. There is difficulty in carrying out the work so thoroughly that a perfect dead area is created about the pines. If a single currant plant or even roots or a small part of them are left, there is great danger that the rust will pass by way of this plant to the region beyond the dead area in much the same way as a man uses a stepping stone in a stream too broad to be crossed at a bound. One or two plants left in this way may render the whole work useless. It is obvious that the chief difficulty in this case would arise in connection with wild currants. The orderly rows of cultivated currants would be easily and surely disposed of, but wild currants and gooseberries grow in all sorts of sheltered and out of the way

places in the woods and their complete destruction is a very difficult and, therefore, costly operation.

Moreover, while this procedure may be advisable in the small isolated areas mentioned, it is scarcely practicable in the Niagara Peninsula where there are thousands of large commercial currant plantations. Yet if these cultivated currants which are now almost all affected by the rust are allowed to remain the rust will probably continue to live on them from year to year, and will doubtless spread gradually, so that any hope of finally eradicating the disease within the Province would have to be given up.

It may be possible to adopt a suggestion made by the Dominion Botanist, and by denuding a broad belt of both pines and currants separate this affected area from the pine producing territory farther north. Such a measure would afford a temporary barrier to the spread of the disease and might arrest its progress until we are in a position to deal with the question in the light of greater knowledge. It is my opinion that this barrier belt would not be permanently useful—that in a few years the rust would pass over it as it might well do in a number of ways, and its chief value would be to give time for working out a settled policy.

If we are unable to prevent the spread of the rust in the Province, we are then confronted with the problem: Can pines be grown in spite of its presence. I think an affirmative answer will finally be given to this question, though we are unable to give such at present. The answer involves a number of factors concerning which we have as yet but very limited data, such as the distance spores are carried from pine to currant and from currant to pine, the susceptibility of pines at various ages, the number of wild currants and gooseberries which may be permitted in and about a pine plantation without rendering it commercially profitless, and the cost of destroying wild currants in a given plantation. It may happen that after investigation has been carried out along these lines, methods can be worked out by which white pine forests may still be grown *with profit*. It should be kept in mind that this disease can scarcely be regarded as threatening to existing stands of mature or nearly mature pines. It is a danger which mainly concerns the younger trees which ought to grow up into a future timber supply, and since reforestration will in the natural course of things become a vital necessity for Canada, the problem is one that pre-eminently pertains to a reforestration policy.

The situation may be shortly summarized by a series of alternatives, thus:

Eradication, if possible; failing that

Segregation, if possible; failing that

Regulation, if possible; failing that

Resignation—the giving up of white pine altogether as a commercial forest tree.

It is not yet possible to say at what stage in the above series we shall be able to stop. So little is known about the disease in America that we cannot foretell the future with confidence. The experiences with the same disease on our white pine in Europe are helpful to some extent, but it is quite possible that under different climatic conditions the course of the disease and the amount of the damage done in the American continent may not be at all comparable to the European situation.

The recent activities of the various states and the aroused interest of the provinces of Canada lead us to hope that within the next year or two at most, sufficient data will be available for determining with a fair degree of accuracy just what policy it will be wise to pursue in future.

THE MARKETING SITUATION IN THE NIAGARA DISTRICT.

F. A. J. Sheppard, St. Catharines.

The theme that your committee has chosen for me to speak to you about for a few minutes this afternoon, "The Marketing Situation in the Niagara District," has been the subject of a lot of discussion and the source of a lot of anxiety and worry both by the growers themselves and by the buyers and dealers and shippers throughout the district for the past three years. A number of meetings have been held and a lot of time spent by growers and dealers, assisted by officials of the Department of Agriculture, discussing the various phases of the situation in the hope that some scheme could be devised which would materially assist in the marketing and distribution of the tender fruits of the district, whereby an adequate return would be assured to the grower for his labor and expenditure in producing good fruit.

One of the great drawbacks in the marketing of our fruit is the lack of uniformity in our packing, almost every grower has a different idea about what constitutes a No. 1 package of fruit. I have on several occasions attempted to load cars of peaches that would be uniform in size throughout, but it is seldom that you can get 1,200 11-qt baskets from one man in a day, and if you have three or four different growers' fruit in the car, you are sure to have a great variation in pack and size of fruit, and adjustments often have to be made because our customer in 99 cases out of 100 will fix the standard of No. 1 stock by the largest in the car, and will often maintain that there are a certain number of baskets of No. 2 fruit, simply because it did not come up to the standard of a few baskets of fancy stock put in by some grower at the same price.

In order to satisfy our customers and get repeat orders, it is of the utmost importance that we have some standard of pack whereby the dealer may know what he is to receive when he orders a certain grade of fruit. At the present time outside of apples, we have nothing to go by for grade in the tender fruits except what we find in the baskets which as most of you know in some cases run from No. 3 up to fancy. The result of this kind of packing is that a large amount of our fruit has to be shipped on commission and thrown on the open market to bring what it will because the pack is so indifferent that the dealer cannot buy it to send out to his customer at a fixed price.

My own idea of a remedy for the existing conditions lies in the central packing-house system. A system whereby packing houses would be established at all the large shipping stations where the growers could bring their fruit fresh from the trees and have it packed and graded by expert packers whose only interest in the business would be to make a uniform pack and give a square deal to everyone. The fruit could then be precooled and shipped out on order with a definite guarantee of grade and quality. In connection with these packing houses, I would establish a central selling agency, managed by a man of high ability, who would gather around him a staff of salesmen sufficient to cover the territory in which it would be profitable and possible to ship tender fruits. With such an organization as this, I believe every basket of our fruit could be profitably marketed, and at a cost very much less then we are paying at present.

Our chief competitors in the business at present are our friends in British Columbia and the Western States, and were it not for co-operative packing and selling, they could not stay in the business a year. I might also mention that in one of the large grape belts of New York State, a selling association such as I

have mentioned handled 90 per cent. of the grapes at a cost to the growers of 1 cent per 12-qt. basket, and ½ cent per smaller package, and netted the growers an average of $40 a ton and better. It would appear from efforts put forward last year, that our fruit growers are not yet ready to adopt the above system, and while nothing up to the present has been obtained in a co-operative marketing scheme, I am glad to report that through the efforts of the Niagara District Sellers' Association organized last season, and which was composed of about 90 per cent. of the co-operative company's buyers and dealers in fruit of the district, we were able to realize for the growers an advance of at least 20 per cent. over prices obtained in 1915.

Some of you will remember that at our meeting last year, one of the speakers mentioned the fact that the fruit grower of late years had not been receiving his just share of the prosperity which our people in other lines were enjoying, and went so far as to say that some of the fruit growers had ceased to wear "the smile that won't come off." This condition reached the climax in 1913, when thousands of baskets of peaches and plums were left to rot on the trees because the price realized on the commission was not sufficient to pay the cost of package and transportation. It was realized that with a tremendous number of young trees coming into bearing in the next two or three years, something must be done to further the distribution and sale of our fruit if we were to avoid disastrous results. With this in view, The Niagara Peninsula Fruit Growers' Association of St. Catharines in the spring of 1915 organized the Niagara Peninsula Publicity campaign, and spent between $3,000 and $4,000 in advertising the tender fruits of the district, and in trying to stimulate the consumption of Niagara Peninsula fruit in the smaller towns thus giving a wider distribution. While the prices realized in 1915 were not large, it was felt that the advertising did a lot of good, as we were able to dispose of all of the crops. This work was carried on again in 1916, and we hope will be further extended in 1917.

The growing of tender fruits in the Niagara District has assumed large proportions in the last decade, it being estimated that in 1915 approximately 100,000 tons of fruit were shipped, valued at about five and one-half millions of dollars. To market and distribute so large an amount of fruit as this in the short season allowed us requires the earnest co-operation of growers, shippers, transportation companies and retail dealers to make it a success. Good work has been done in the last few years by the transportation companies in arranging their schedules so as to give special despatch to fresh fruit shipments, and by making special fruit rates on car loads and half car loads to the smaller towns. We ask that these rates be further extended. The company that I have the honor to represent—The St. Catharines Cold Storage and Forwarding Co., Ltd., ship each year a large number of cars of tender fruit to Winnipeg and the Canadian West. In June last I made a trip to Winnipeg to study conditions and try to find out why Niagara District fruit sells for such varying prices on the Winnipeg market. I spent considerable time discussing the business with the wholesale dealers, and also spent a couple of days interviewing the retail dealers for the purpose of finding out what condition our fruit arrived in, and also how the quality compared with the Western fruit.

In every case I found that when Niagara district fruit arrived in good condition, it was considered superior in texture and flavor to the Western fruit, and that the people of the middle West would be glad to handle our fruit; but on account of the large percentage of loss caused by indifferent packing and so many inferior specimens being placed in the baskets, the Winnipeg dealers found it

more profitable to buy the product of the Western States and only want to handle our fruit on commission.

In conclusion, let me urge our Ontario fruit growers not to be satisfied with the present conditions, but to rise nobly to the occasion and use every effort to overcome it, and not be satisfied until they have grown their fruit so good and packed so uniformly that all the dealers in Toronto, Montreal, Winnipeg and all our other cities and town will be asking for Ontario fruit, and will become boosters for the sale of it to the great advantage of both grower and consumer.

F. C. HART: The question of mobilizing the growers and co-operative associations and dealers in the Niagara district and the marketing of fruit there is a large proposition. We have been working at it for some time. Difficulties in the way seem to be cropping up at all times, and the work seems rather slow for many reasons. Everybody seems to be of the opinion that with a proper business organization, the solving of this question of the advertising of the grading and standardization of packages will be effected. The main difficulty is to create a business organization that can handle a business of that size. Possibly this is not the place to go into the details of such difficulties, but the old question is not shelved at the present time. We are still working on it and hope to be able to soon take in the growers, co-operative associations and dealers on an equitable basis so as to handle the fruit of the Niagara district. We may have to start with a little less ambitious scheme in the near future, but ultimately the fruit of the Niagara district will go out under one organization. That is what we are working for, and it will come sooner or later. How soon it will come depends largely upon the growers and dealers in the district.

MR. FLEMING: I would like to ask Mr. Sheppard if he thinks the labelling system was a success? In the Niagara district they issued a label, and there was no direct supervision over packages upon which the label was placed. The question is whether the label is a good thing unless there is supervision.

MR. SHEPPARD: In answer to Mr. Fleming's question, I might say I was not very favorable to the label, just for the very reason that he has given. The idea in having the label was that people who secured fruit under that label would be looking for it again. The question Mr. Fleming has brought up was one which came into my mind very strongly that people would use a label on poor fruit. If we do not put the right kind of stuff under the label, it has an adverse result; because if the people do not get a first-class article with the label they would not ask for it any more. I am pleased to say that in St. Catharines the people who use the label put it on their best fruit only, but it was not used sufficiently to get it properly before the public. A number of the growers bought the label to help on the advertising scheme simply to give us money to carry on the work, and after they got them, they put them on the shelf and did not use them at all. I cannot say whether the committee will adopt the label system next year or not, but if we do it is up to us to see that the goods that go under that label are sufficiently good to warrant the people coming back and asking for more.

MR. SMITH: I examined a great many packages of fruit with the label on, but I did not find that they were any better than a great many other packages that came from the Niagara district without the label. I did not find any packages with the label that were in violation of the Act, but there were a great many packages in violation of the Act from Niagara district this year. I could not say that the packages with the labels stood out very strongly.

MR. CAREY: I noticed in a half dozen cases the label on very inferior fruit.

It was not in violation of the Act, but the quality was very poor, and it struck me that that was cutting the ice the wrong way.

THE CHAIRMAN: If these labels get into the hands of thoroughly conscientious growers, then it would be all right, but if they get into the hands of unscrupulous people then the reverse will be the case. If the label is put on a very ordinary basket of fruit, then it does more harm than good.

MR. CRAISE: I used about 10,000 of these labels last year, and as it was a new thing, and as I was in touch with Mr. Sheppard in regard to it, I tried it out as an experiment, using them on part of our shipment each day for two or three weeks at a time, shipping some with and some without the label of the same quality of fruit. We ship entirely to one commission man and he knows our goods. We asked him to keep a separate account of the baskets that went with the label and without the label, and his returns gave us about 5 cents a basket more during the season for fruit with the label, and it was all the same class of fruit.

MR. FLEMING: I used these labels entirely for the late packages of fruit, and I found it created quite a demand for the fruit, and I think it was a boon for the district. I was very careful as to the kind of fruit that went into these baskets. I was told at the end of the season by the manager of one of the large co-operative companies that he had seen fruit shipped with this label on the baskets that he would not handle. It seems to me that is advertising the wrong way, but if we can have some supervision and only a certain standard of fruit with the label on, I think it would have a very beneficial effect. I would like to find out if there was any way in which the Government could help us to see that fruit with the label on was up to standard.

MR. JOHNSON, Fruit Commissioner: I would not like to commit myself on that just now, but I can assure you that my sympathies are with you in your work, and I would be very glad to consult with you and talk the matter over with you, and if it does not interfere with our work, we would be very glad to help you out. I can assure you that you could have my co-operation and sympathy in every way.

MR. ROBERTSON: I think the opinion in our district was that the label, like a revolver, was not to be placed in every one's hands, because it might go off the wrong way and do some damage.

MR. SHEPPARD: My idea and the idea of the committee two years ago was that the growers themselves should help to do this advertising. We had a systematic canvass of our section for subscribers. We asked the large growers to give $10 and the smaller ones $5, and others to give a lesser sum. We felt that everybody should do something to help. We raised considerable money but we found we could not go back and get it again. A great many people claim that they did not receive any direct advantage. They were looking for something in which they could put $5 and get back $10, and we thought the scheme of selling the labels to be put on their baskets of fruit would be a good one. Mr. Craise says he realized 5 cents more a basket for his fruit with the label on, and the label cost him less than half a cent. I do not think there is anybody here who would not pay out half a cent if they were going to get 5 cents for it. We feel that if the right kind of fruit is used that this label will be a great advantage, and the people will come back and ask for more.

A MEMBER: I think the time has come when every man should stamp his name on the package. Every man who sends fruit to the market should put his name on the package, and then the people would know where it came from. I believe that would be better than the labels.

MR. TERRY: I had the pleasure of being on the fruit market one morning when berries were being sold. While I was standing there, three or four gentlemen came up inquiring for my berries. I always stamp the crate with my own name. I said to these gentlemen, "Why do you ask for that man's berries?" and they said, "Because he always puts them up nice; he fills up his crate." I am not trying to blow my own horn, but I am telling you that is why these men were coming back for my berries. If I had put them up in a poor way, they would not have been there asking for my berries, and I think if we put up our fruit properly it will be sure to find a good market.

The Convention then adjourned.

ANNUAL REPORT

OF THE

Bureau of Industries

FOR THE

PROVINCE OF ONTARIO

1916

PART I.—AGRICULTURAL STATISTICS
PART II.—CHATTEL MORTGAGES

(PUBLISHED BY THE ONTARIO DEPARTMENT OF AGRICULTURE)

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To His Honour Sir John Strathearn Hendrie, C.V.O., a Lieutenant-Colonel in the Militia of Canada, etc., etc., etc.

Lieutenant-Governor of the Province of Ontario, etc., etc.

May it Please Your Honour:

I have the honour to present herewith for your consideration the Report of the Ontario Bureau of Industries for the year 1916.

Respectfully yours,

William H. Hearst,

Minister of Agriculture.

Toronto, 1917.

Ontario Bureau of Industries

PART I.—AGRICULTURAL STATISTICS.

THE WEATHER.

TEMPERATURE.—The following table gives the temperature of the Province for each month during the last five years, together with the mean annual temperature, also the mean temperature for the six months April-September—practically the growing season—together with the average for the five years 1912-16, and the thirty-five years, 1882-1916:

Month.	1916	1915	1914	1913	1912	1912-1916	1882-1916
	°	°	°	°	°	°	°
January	24.9	18.7	20.9	26.1	7.7	19.7	18.2
February	15.1	22.7	10.7	15.4	13.6	15.5	17.1
March	21.6	27.3	27.4	29.0	21.1	25.3	26.6
April	43.1	48.6	39.7	44.3	39.5	43.0	41.9
May	53.2	50.9	57.0	52.4	54.9	53.7	53.7
June	60.1	61.0	63.1	63.2	60.0	61.5	63.4
July	74.0	66.9	67.5	68.1	67.8	68.9	68.2
August	70.1	64.2	65.9	66.4	62.2	65.8	65.5
September	59.5	61.5	58.8	57.8	60.7	59.7	59.3
October	47.4	50.0	50.8	49.4	49.3	49.4	47.3
November	34.9	39.1	34.5	40.3	37.1	37.2	35.3
December	22.1	23.9	21.3	29.3	28.0	24.9	23.7
Annual mean	43.8	44.6	43.1	45.1	41.8	43.7	43.3
Mean for 6 months, April to September	60.0	58.8	58.7	58.7	57.5	58.8	58.7

The mean temperature for 1916 was 43.8 degrees, being 0.8 degrees lower than the preceding year, and 0.5 higher than the normal for the thirty-five years 1882-1916.

The mean temperature for the six growing months, April-September, was 1.2 degrees higher than the previous year, and 1.3 degrees above the thirty-five year normal. January, July and August were much in excess of their normals, while February, March and June ranged from 2 to 5 degrees below.

SUNSHINE.—In the following table the averages of sunshine are, as usual, derived from the records of the weather stations at Woodstock, Toronto, Lindsay, Kingston and Ottawa:

Month.	Sun above horizon.	1916	1915	1914	1913	1912	1912-1916	1882-1916
	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.
January	285.7	71.8	73.1	66.0	61.3	98.7	74.2	74.9
February	*302.5	96.6	92.7	148.8	111.8	109.7	111.9	104.1
March	369.9	158.4	197.0	128.9	106.7	181.2	154.5	144.7
April	406.4	154.1	186.9	137.6	207.5	177.3	172.7	183.2
May	461.1	206.7	222.4	263.0	241.4	188.9	224.5	211.2
June	465.7	192.0	267.4	262.1	315.5	281.6	263.7	246.7
July	470.9	309.8	236.1	266.0	297.5	264.2	274.7	267.9
August	434.5	275.1	194.4	223.7	257.6	153.8	220.9	240.2
September	376.3	167.6	195.3	210.8	213.4	114.0	180.2	186.0
October	340.2	154.9	146.9	137.5	121.4	147.3	141.6	140.0
November	286.9	101.7	92.6	83.9	95.1	82.9	91.3	79.5
December	274.3	72.8	64.3	66.1	78.6	52.4	66.8	61.1
Total for the year..	4,474.4	1,961.5	1,969.1	1,994.4	2,107.8	1,852.0	1,977.0	1,939.5
Total for six months, April to September.	2,614.9	1,305.3	1,302.5	1,363.2	1,532.9	1,179.8	1,336.7	1,335.2

The year 1916 had 1,961.5 hours of sunshine, or 23.2 hours more than the average for the last thirty-five years. The six growing months, April-September, had 1,305.3 hours of sunshine, or 29.9 hours less than the average for the 1882-1916 period. Six months of the year had an excess and six a deficiency, July with 41.9 hours above and June with 54.7 hours below having the greatest departures.

PRECIPITATION.—The fall of both rain and snow for the five winter months, including November, 1915, and March, 1916, is given in the following table for five years, together with the average for the thirty-five years, 1882-1916. One inch of water is equivalent to ten inches of snow:

Months.	1916	1915	1914	1913	1912	1912-1916	1882-1916
November:	in.	in.	in.	in.	in.	in.	in.
Rain	1.92	1.81	2.78	2.66	2.52	2.34	2.03
Snow	4.3	7.7	3.8	7.4	13.4	7.3	7.4
December:							
Rain	0.69	0.43	0.23	1.18	1.44	0.79	1.16
Snow	18.8	17.2	6.8	11.2	9.1	12.6	15.2
January:							
Rain	2.26	0.90	0.56	2.45	0.44	1.32	1.02
Snow	14.9	16.3	21.5	13.6	25.4	18.3	19.2
February:							
Rain	0.07	1.29	0.24	0.31	0.08	0.40	0.78
Snow	19.4	10.7	12.1	13.2	16.8	14.4	16.1
March:							
Rain	0.57	0.18	0.88	2.82	0.20	0.93	1.16
Snow	17.9	5.1	11.2	13.8	14.1	12.4	10.7
Five months:							
Rain	5.51	4.61	4.69	9.42	4.62	5.78	6.15
Snow	75.3	57.0	55.4	59.2	78.8	65.0	68.6

* Leap year; in other years 291.4 hours.

The total amount of rainfall for the five months, November-March, was 5.51 inches, or 0.64 inches below the average for the thirty-five years, 1882-1916.

The total amount of snowfall was 75.3 inches, or 6.7 inches above the average. December, February and March were above with 3.6, 3.3 and 7.2 inches respectively, while November and January were below with 3.1 and 4.3 inches.

The sixth months, April-September, however, comprise what is regarded as the growing season for most crops, and the following table gives the rainfall of these months for the last five years, 1912-1916, and for the thirty-five years, 1882-1916:

Months.	1916	1915	1914	1913	1912	1912-1916	1882-1916
	in.	in.	in.	in.	in.	in.	in.
April	2.64	1.15	1.93	2.77	2.24	2.15	1.78
May	4.51	2.18	1.99	1.93	5.08	3.14	2.86
June	3.78	3.06	2.39	1.77	1.56	2.51	2.74
July	1.53	3.86	1.41	2.46	2.61	2.37	2.78
August	1.99	5.54	3.81	3.43	4.33	3.82	2.68
September	2.75	3.39	2.28	1.64	3.98	2.81	2.62
Total for six months	17.20	19.18	13.81	14.00	19.80	16.80	15.46

The rainfall for the six months, April-September, comprising the growing season, was 17.20 inches, or 19.8 inches less than the previous year, and in comparison with the normal for the thirty-five year period was 1.74 inches in excess. July and August were the only months which were below average, the others ranging from 0.13 to 1.65 inches above.

VEGETATION AND SPRING SOWING.

Vegetation.—Cold, backward weather had delayed vegetation fully a week later than usual when correspondents reported on spring conditions as they appeared about the middle of May. The ground, however, had been thoroughly saturated by the rains, and it was hoped that with warm weather ensuing a rush of growth would occur. Pastures were relatively farther on than orchard leaf or blossom. Some live stock had been turned on the grass, but many cattle were yet in the stable.

Spring Sowing.—Referring to conditions existing on the 15th of May, it was computed that not half the expected area of spring grain seeding had yet been done. While a few fortunate individuals on high, light or well drained soils had finished the job, many had not been able to even get on the land, and were anxiously waiting for a few days of continuous dry weather. The ground, particularly heavy clays, suffered from the very wet summer of the preceding year as well as from the rains of the present season, and its condition was variously described by correspondents as "soggy," "sticky," "tough," and "sad." A good seed bed was impossible in most cases, although some "mucked in" a portion of their seed, taking a chance of early germination. It was then thought that the delayed sowing season, with a scarcity of suitable help, would render farmers

very busy during the remainder of the spring, and that grains would consequently have a reduced acreage. Later field crops, such as corn, buckwheat, beans and potatoes were likely to be more extensively grown in order to make up the deficiency. More mixed grains were likely to be sown for feeding live stock—chiefly oats and barley.

STATISTICS OF FIELD CROPS.

The following table gives the acreage, production and market value of the field crops of Ontario for the year 1916. Detailed tables showing the statistics by counties will be found elsewhere in this report.

Crops.	Acres.	Bushels.	Bushels per acre.	Market Value	
				Total.	Per acre.
				$	$ c.
Fall Wheat	704,867	14,942,050	21.2	24,099,591	34 19
Spring Wheat	144,305	2,213,961	15.3	3,591,681	24 89
Barley	527,886	12,388,969	23.5	12,621,940	23 91
Oats	2,689,762	71,297,528	26.5	47,066,428	17 50
Peas	95,542	1,243,979	13.4	2,618,754	27 41
Beans	53,999	583,105	10.8	3,183,086	58 95
Rye	148,738	2,354,410	15.8	2,797,290	18 81
Buckwheat	229,205	3,261,888	14.2	3,555,699	15 51
Corn (for husking)	258,332	12,717,072	49.2	9,446,060	36 57
Potatoes	139,523	7,408,429	53	9,684,215	69 41
Carrots	2,391	331,124	138	46,357	19 39
Mangels	42,793	9,756,015	228	1,365,842	31 92
Turnips	91,670	24,067,699	263	3,369,478	36 76
Sugar Beets	22,482	6,023,938	268	843,351	37 51
Mixed grains	485,986	13,297,354	27.4	12,485,065	25 69
		tons.	tons.		
Corn (for Silo)	439,411	3,276,185	7.46	10,647,610	24 23
*Hay and Clover	3,471,984	7,200,047	2.07	76,326,501	21 98
Totals:					
1916	9,548,876			223,748,948	23 43
1915	9,762,951			210,674,415	21 58
1914	9,621,444			199,152,945	20 70
1913	9,541,537			168,455,253	17 65
1912	9,574,474			185,790,341	19 40
1911	9,718,741			179,974,358	18 52
1910	9,725,684			175,115,742	18 01
1909	9,578,323			167,966,577	17 54

* Including alfalfa.

The acreages devoted to the other crops in 1916 were as follows: Orchards, 280,653; small fruits, 22,817; vineyards, 9,807; garden, 57,107; rape, 38,566; flax, 5,880; hops, 207, tobacco, 7,997 (Essex, 5,826; Kent, 1,444). Summer fallow, 331,736; pasture (cleared), 3,409,581.

THE GRAIN CROPS.

Fall Wheat.—The November, 1915, bulletin said: "The acreage now growing for the 1916 crop will be about three-fourths of that of the area cut in 1915, and will also be less than the acreage in 1914. In some localities the land was too wet for early sowing, and considerable of the seed was put in later than usual,

the result being that a portion of the crop has not as much top at present as is generally seen. The fields look thrifty on the whole, however, and the crop promises to enter the winter in vigorous shape."

Conditions about April 12th were thus described in the April bulletin: "Fall wheat so far gives excellent promise. The top is not so heavy as usual, as much of the crop was sown late owing to wet ground, but the fields were well protected by snow during the winter, and now have a healthy and vigorous appearance. So far there has been but little injury from spring 'heaving,' and there are very few complaints of injury from insects."

The May bulletin had the following to say regarding fall wheat: "This crop so far promises excellent returns, except where affected by frequent spring rains on low spots or on untiled land. Some correspondents mention a comparative lack of sunshine so far this season, which, with the prevailing cool weather, has retarded growth; but the general tone of the reports is more or less cheerful, as less fall wheat land than usual will be plowed up or resown. There also have been fewer complaints of injury from insect pests."

The crop lived up to expectations, and the August summary of the returns was to the following effect: "Fall wheat is relatively the best cereal crop of the season, both for grain and straw. While the yield is much below that of the bumper crop of 1915, it is above the average for the thirty-four-year period, and practically equal to that of the average of the last ten years. The fields gave great promise in early spring, but the cold, wet weather following, succeeded by the unusually hot, dry days of July, influenced the crop unfavorably. There is a wide variance in the yields, which runs from 14 to 40 bushels per acre, and the quality also varies greatly; for while the bulk of the crop is of excellent grade, more shrunken grain than usual is reported as the result of the intense drouth. The crop on drained land showed best results under both wet and parching conditions. Cutting ranged from July 17th to August 7th, and the crop was got into the barn under most favorable conditions."

The November bulletin said: "The yield and quality of fall wheat, while not up to the more recent Ontario standard, are nearer the mark than that of any of the other cereals except rye. The yield is practically an average one. The straw is of good length and quality, and the crop was well harvested."

The New Fall Wheat.—The condition of the newly sown fall wheat was thus described as it appeared early in November: "Owing to the drought in August most of the new fall wheat was put in later than usual. The seed-bed in most cases was very dry and hard, and in many instances germination was slow and uneven. Owing to so much late sowing the young fall wheat fields have not had so large a top as usual, although late rains have brought the crop forward more encouragingly. On account of the late harvest, and the rush of farm work generally, because of the lack of labor, the acreage sown is about one-fifth less than that of the 1915 crop. Very little injury was reported from the Hessian fly or other insects."

Spring Wheat.—"This crop is still decreasing in acreage," said the August bulletin. "As in the case of all spring grains the season was too wet for satisfactory sowing, and much of the crop had to be 'mudded in.' The yield will be about an average, but there will be considerable small, light grain, and the straw will be rather short, owing to the hot July weather. Harvesting ranges from August 7th to 19th."

November reports concerning spring wheat were not so favorable as those received in August, complaints being made as to the light weight of the grain. The crop is not now a popular one in this Province.

Barley.—The cold and rainy spring weather was unfavorable to seeding, and the crop got a poor start. The prolonged drouth of July was also trying to the fields, forcing ripening. As a result many of the heads of grain were not well filled, and, according to the August reports, the average yield was expected to be less than usual. The straw, though clean, was not of good length. Cutting extended from July 28th to August 15th.

The November bulletin stated that barley was below the average in yield per acre, and some of the grain was reported to be light in weight, although as a rule it was of good color.

Oats. "Sowing was more or less delayed owing to the wet spring," according to the August bulletin, "and many fields as a consequence received a poor start, both as to time and condition, particularly on low, undrained land. The unusually hot and dry weather prevailing later in the season hastened ripening, resulting in much of the grain being light in weight and in average yield per acre. The straw also is short, but of fair quality, owing to the dry weather prevailing during the later half of the season. Occasional mention only was made of rust or smut. Harvesting began on August 10th, but considerable of the crop still remains to be cut."

The November bulletin stated: "There has been an unusually small yield per acre of oats, and much of it measures very light to the bushel. Some rust is complained of. Much of the crop was harvested very late, but the weather was favorable."

Winter Rye. There is not a large acreage of rye grown for grain, much of it being fed green. According to the August returns it has stood the severe drouth of the latter part of the growing season better relatively than any other of the grain crops, and was expected to be above the average in yield.

The November reports had little to say of rye, beyond expressing the opinion that on the whole it was a good crop, both as to yield and quality.

Peas. Formerly one of the most popular crops in the Province, peas have now only a comparatively small acreage. The hot and unusually dry weather prevailing at the time of blossom had affected the yield, which was below the average. There was less complaint than usual of injury from insects. Pulling was in progress when correspondents reported about the middle of August.

The November bulletin stated: "The dry, hot weather prevailing during the summer, especially at the time of filling, told against the crop, which is generally described as a poor one. Complaints are also made of the peas splitting at threshing. Very little injury is reported from the weevil."

Buckwheat. Buckwheat did not do so well as usual. Like other crops it had a late start owing to rainy weather, and much of it was caught by frost before cutting. The great heat and drouth at the time of blossoming also kept the grain from filling in best condition. The yield was variously described in the November returns as being from one-half to fair, and proved to be only a little better than a two-thirds crop.

Beans. Owing to the wet weather much of the crop was planted late. The long period of drouth following also affected the plants unfavorably, especially at the period of blossoming, and a light yield was expected when correspondents reported about the middle of August. Harvesting extended from the beginning of September to the middle of October.

"This crop experienced a rather poor season," said the November bulletin. "While wet ground made planting late, the weather turned very hot and dry at the period of filling, and some of the pods did not fully mature. A portion of the crop was also caught by the frost. The harvesting season, however, was favorable."

Mixed Grains. A late variety of barley and an early variety of oats are said by some correspondents to make an excellent combination for growing mixed grains, as they ripen closely together. They are sown in about equal proportions, or perhaps more oats than barley. Varieties suggested by a number of leading correspondents are: For barley, No. 21 O.A.C., and for oats, Daubeney or No. 3 O.A.C. A few correspondents state that the mixture is improved by the adding of wheat to the sowing, and there are scattered suggestions for the addition or substitution of peas, flax or buckwheat. Among the advantages claimed by the advocates of mixed grain growing are: (1) If one grain does not succeed the other may. (2) The one crop cutting is easier to harvest. (3) The oats fill out better, the heads not being crowded. (4) The product makes an excellent chop for live stock. On the other hand, some correspondents assert that there is no advantage whatever over grains grown separately and mixed later.

Corn. The August bulletin said: "The weather was so wet at the regular time of planting that much of the seeding was delayed. The unusually long period of drouth following was also trying to the plants, baking the soil and making cultivation difficult. The result is that the majority of the corn fields are more backward in growth than is usual at this time of the season, and it will require most favorable weather from now on to bring the crop along to anything like average form. Ensilage corn is doing relatively better than corn for the cob."

"The corn crop is the first really poor one for many years," was the conclusion arrived at in the November bulletin. "Planting was much delayed owing to rainy weather, and a long period of drouth and intense heat followed. As a consequence the general yield is a light one, there are more nubbins than usual, and first-class seed corn is likely to be scarce. Although the silage varieties have done better than those grown for husking, many silos will be only partly filled this fall. Some corn was nipped by frost, but the bulk of it was got in uninjured."

HAY AND CLOVER.

Speaking of clover the April bulletin said: "This crop, like fall wheat, has come through the winter in good shape, except on very low places or on poorly drained land. There has been but little injury from heaving, and at present the promise is for one of the best hay seasons for years. Alfalfa is also promising well."

"Hay and clover, judging from the present outlook, should be one of the best crops for years," was the opinion expressed in the May bulletin. "The fields, especially those of last year's seeding, came through the winter in fine form, and there was but little heaving or other injury from spring frosts. As in the case of fall wheat, a small portion of the crop, owing to the very wet spring, has been drowned out on low-lying places where the fields were not well-drained."

The hay crop proved to be fully up to expectations. The August bulletin ran: "Not for many years have such satisfactory reports been received regarding the various grass and clover crops. Heavy yields were the rule, and the weather at harvesting was almost perfect for curing, thus ensuring first-class quality. In a few cases, however, lack of labor delayed cutting until the fields were rather too mature."

Clover Seed. The season has been a relatively good one for clover seed. The fields kept for seed were, as a rule, well headed, although the plants were rather short in stand. In too many instances, however, clover fields set by for seed had to be pastured owing to the scarcity of fodder. The midge was complained of in only a few localities.

Alfalfa. Alfalfa looked more uneven than clover in the spring, not having wintered so well as the sister crop. However, there were some reports of splendid fields, and an average general yield was looked for.

FIELD ROOTS.

Potatoes. "The present outlook for potatoes is poor," said the August bulletin, "although some correspondents say that a few good rains might redeem the situation. Owing to the rainy spring weather some of the crop had to be planted late, while a considerable portion of the earlier planting rotted in the long-soaked and cold soil. The prolonged period of drouth during July was also trying to the vines. The bug was very injurious this season, owing to the dry summer and scarcity of farm help."

November reports were to the following effect: "The season was too dry for potatoes. The average yield was a comparatively light one, and the size of the tubers was below the standard, although they were generally of good quality. In some localities there were hardly enough potatoes for local use. The crop was stored under favorable conditions.

Roots. The August bulletin contained the following: "There is a very uneven showing of all classes of roots, owing to the late start many of the fields received on account of the wet spring, and the trying effects of the dry and very hot weather which has prevailed more or less since the beginning of July. While both turnips and mangels are considered to be backward in growth and general condition, a number of correspondents are of opinion that timely rains would greatly restore and push forward the root crops generally, although anything like standard yields might not be looked for."

The bulletin issued in November had the following references to the various classes of field roots:

Turnips. This crop was generally referred to as being late, and small as to both yield and size. The drouth of July and August hindered growth, and

complaints were also received of injury from aphis or louse. About half the crop had been harvested by the 1st of November, but as the weather was then open a good portion of the remaining crop was left in the ground for further growth.

Mangels. Mangels may be characterized as light in yield, small in size, but sound and of fair quality. Like the other roots, they suffered considerably from the drouth.

Carrots. Field carrots are not now much grown. They also suffered from the drouth, and are described as being from fair to good.

Sugar Beets. This crop is no exception to the comparatively poor showing of roots. They are small in size and light in yield as a rule, although some more favorable reports have been received.

MISCELLANEOUS.

Tobacco. "Like most of the other field crops, tobacco suffered both in area and quality from the very wet and otherwise unfavorable weather prevailing at the time of planting," the August bulletin said. "The later exceedingly warm and dry period also told against the vigor of the plants, which are now considered to be very backward in growth. The uncertainty of the market also helped to prevent a full acreage."

The November bulletin stated that some tobacco was caught by frost, owing to planting being delayed by rains. The bulk of the plants, however, escaped uninjured, and the crop at the end of October was said to be promising, both as to yield and general condition.

Threshing and Marketing. "The comparatively small yield of most of the grains has enabled threshers to have their work practically completed by the first week of November," said the November bulletin. "Marketing so far has been light, except where farmers were requiring ready money for taxes or other pressing needs; for although prices are soaring for all kinds of grains, the hope of getting even higher figures prevails with many holders. Others claim that with the present and prospective prices for live stock it pays best to feed the grain on the farm, at the same time enriching the land."

Fall Plowing. Plowing was fairly well advanced at the end of October, as the root and corn crops were smaller than usual and threshing was also light. The chief drawbacks were the lack of plowmen, owing to the war, and the dry and hard condition of clay soils on account of the summer drouth. Timely rains, however, were then falling, and with a fair spell of open weather ensuing an average acreage should be turned under.

Farm Improvements. A considerable quantity of tile for underdraining has been laid this season, more particularly in Essex, Kent and other more western counties, the digging having been done chiefly by traction ditchers, which have had all the business they could do. More drainage work still would have been done by manual effort if labor was not so scarce and high in price. From the remarks of correspondents it is plain that farmers are more and more appreciating the benefits of underdrainage. Considerable advance has been made in wire fencing, although some consider the present price of wire as being almost prohibitive.

There has not been as much done as usual in the way of erection of farm buildings, owing to the scarcity of skilled workmen, although a number of farmers have altered their barns by raising them, putting in cement foundations, and otherwise bringing them more up-to-date.

FRUIT AND FRUIT TREES.

The April bulletin said: "The winter was not trying to fruit trees, the greatest damage to orchards resulting from the girdling of young trees by mice and rabbits driven to hunger by the deep snow lying so long. In some instances grape vines and raspberry canes have been frozen back more or less, owing to tenderness from the late fall growth, but the injury will not likely affect the general yield. Strawberries and other small fruits are about normal. The San José scale is still complained of in the Lake Erie counties, where it has got a hold in many old orchards, but elsewhere this pest is being combated in its earlier stages and is being kept more under check. The general outlook at present for all classes of fruit is favorable, apple buds giving better promise than for years."

"Spring prospects for fruit, generally speaking, have never been surpassed," said the May bulletin. "Very little winter injury has happened to orchards, rabbits and mice having done more damage than the elements. So far this season there has been no frost to injure fruit buds, and all classes of orchard trees are making a most promising show of blossom, although about a week or two later in showing than usual. Owing to the frequent rains of the last few weeks spraying operations have been delayed, and the results of this forced neglect may be seen later. While some grape and raspberry canes have been more or less frozen back on account of all the heavy fall growth failing to mature, both of these fruits are expected to average up after all. The other bush fruits and strawberries give promise of generous yields."

August returns were thus summarized: "All classes of orchard trees made a fine show of bloom, but frequent and heavy rains then falling washed off much of the pollen, and the setting of fruit was more or less a disappointment. Apples will be comparatively light in yield, more especially the winter varieties. There has been much 'dropping' during the summer, and considerable scab has been complained of. Pears have done relatively better, but will be only about half a crop. Statements regarding the yield of peaches range from poor to good; the yield will probably be about a medium. Cherries were almost a failure; the sour varieties did much better than the sweeter sorts. Grapes will be a good crop where properly looked after. Strawberries started out with promise of a great yield, but fell off with the drouth. Raspberries were more or less a failure, much of the fruit drying on the canes owing to the intense heat and drouth of July, but currants did better."

The November bulletin said: "The usual complaints are made of injury from San José scale and oyster shell bark-louse where orchards have not been properly attended to. The long summer drouth has also weakened many trees. There is a comparatively small supply of apples, especially of the best winter sorts—in some localities not sufficient for local use. The general quality of this fruit is not as good as usual, and there were many windfalls. Peaches, however, were more abundant, and there was a fair supply of pears, plums, and grapes in those sections where these fruits are raised."

PASTURES, LIVE STOCK AND THE DAIRY.

The wintering of live stock was a comparatively easy matter, owing to there being a large quantity of grain on hand which had been more or less sprouted by the wet harvesting. Corn and straw were also in abundance, although not of such good quality as in more recent years, and there was a good average of roots, but hay has been scarce and high in price.

The following reference to live stock appeared in the April bulletin: "The demand for horses, notwithstanding war conditions, has not been encouraging. The animals as a rule are in good working condition, although many have suffered from a mild form of influenza.

"On the whole cattle have wintered well. No serious disease has been complained of, but there have been a few cases of abortion, and a more frequent complaint of a form of indigestion, said to be resulting from eating musty grain, straw, or other fodder. Dairy cattle are said to be rather thin in flesh owing to the heavy drain upon their milking powers during the rich pastures of the midsummer and fall of last year. Beef cattle are not so plentiful as usual, as prices of fat stock have been most enticing. Store cattle are also rather scarce, but are up to the average in quality, although there are complaints that some are rather of the dairy type. Calves are being better cared for than formerly.

"Sheep have wintered well, and lambs are said to be coming on nicely. As with other live stock, much depends upon the handling.

"A correspondent describes the hog as the farm 'mortgage lifter' at present prices. The heavy demand for bacon hogs has made a shortage in the number on hand. There are even less complaints than usual of sickness among swine."

The August bulletin had the following: "Pastures were of the best until the drouth began to tell about the latter part of July. Later on, most of the fields, especially in Western Ontario, were browned by the continued drouth, and in some quarters cattle on the grass had to be helped out by hay or other extra feed. Notwithstanding this drawback, and the extremely warm temperature prevailing during the summer, live stock generally are in good condition—somewhat thin, but hearty."

November returns were to the following effect: "Fall pastures have been very poor owing to the prolonged summer drouth. Cattle as a rule are rather thin, but are healthy. Owing to the high price of beef, and the scarcity and dearness of feed, a large number of cattle have been sold in an unfinished state, and too many calves have been vealed. Some old, dry cows, however, have been sold as canners at three and four cents a pound. Sheep are doing well, and are in strong demand. They have been finished off nicely on rape while ordinary pastures were practically bare. High prices for pork, and the scarcity of feed, have tempted some farmers to part with more sows than is prudent, and to turn off too many animals under weight. The prospects are that there will be a scarcity of all classes of live stock by the spring. Owing to the lack of straw most of them are likely to experience inferior bedding conditions. Considerable progress has been made in silo building."

Methods of Feeding. The April bulletin stated: "No uniform system of feeding live stock is in vogue, methods ranging from the most careful stall feeding to that of carrying the animals over winter on the barest maintenance ration. Most of the live stock are finished off on the grass, or on rape in the fall. The silo is more and more playing a leading part in cattle feeding, both for beef and

milk. One correspondent in Dundas County describes ensilage as 'becoming the staple roughage.' During the winter just ended a large quantity of grain damaged by the wet harvest weather was used to advantage in feeding. Roots and straw figured largely in adding body to the ration, the former still being popular in the western and central counties of the Province."

Fodder Supplies in April. The bulletin issued in that month said: "Owing to there being a good supply of fodder corn and of straw on hand, and also a considerable quantity of sprouted grain for feed, other fodders have held out well, although hay has been fed more sparingly than usual. Live stock will be carried over nicely to the grass."

Fodder Supplies in May. The May bulletin had the following: "While the very late spring has made considerable inroad into fodder supplies, there is still sufficient on hand in most cases to meet requirements. Hay is relatively scarce and high in price, but straw, ensilage, and other coarse fodders help farmers to go light in feeding it. Oats are more plentiful, and are being fed generously, owing to the high price of live stock and their products. The same may be said of wheat, much of which is being turned into pork, as hogs are greatly in demand. None of the inferior grain from last year's wet harvest has been wasted, and even the choicest oats, wheat and barley are at present worth more sold 'on foot' than in the bag. The splendid pastures now promising will soon relieve the drain on the better class of fodders. In short, the Ontario farmer who is into beef-raising or dairying never had more encouraging prospects before him."

Fodder Supplies in August. The August bulletin said: "It is thought that there will be plenty of fodder for fall and winter supplies, notwithstanding the expected shortage of grain, straw, roots and corn ensilage, farmers counting upon the splendid crop of hay to carry them through. Much, however, will depend upon the weather of the next month or two. Dairy produce has been generous in supply, and the demand, at excellent prices, for cheese, butter, cream, and other lines, was never stronger. There has been some shrinkage in production since the drouth, but the high prices now offering are tempting dairymen to keep up the milk supply as much as possible."

Fodder Supplies in November. The bulletin issued early in November thus dealt with the fodder prospects: "With the exception of hay, which gave a splendid yield, and a large quantity of which has been sold, fodder crops are short in supply. There is a scarcity of grains, while roots and corn are seriously behind their usual yields, many silos this year being only partly filled. There is also a lack of straw for bedding, which means much in carrying live stock over the winter. Many correspondents believe that with careful feeding most farmers will meet the situation, especially as there are fewer animals on hand than usual at this time of year. Hay ranges in price from $8 to $14 a ton, generally selling at from $10 to $12. In many cases some concentrated feeds must be purchased, although their high cost is more or less deterrent. Among the prices quoted by correspondents—varying according to locality, and often differing even there—are: Bran, $29 to $32 a ton; shorts, $31 to $36; gluten meal, $35 to $37; low grade flour, $30 to $38; oil cake, $42 to $45; cotton-seed meal, $40 to $45; mixed feed, $40; western oats, 65c. to 70c. a bushel; U. S. corn, $1.10 a bushel and $2 a cwt."

Dairying. The following special reference to dairying appeared in the November bulletin: "Dairying has flourished this season, prices for butter and cheese having reached record heights. Advocates of each of these branches claim pre-eminence in favor. Where in operation, the milk condenseries also have been pressing both cheese and butter factories for popularity, while some correspondents boldly aver that sending milk and cream to the cities pays best of all. The flow of milk in the fall was hardly as free as usual, but the high prices offering impelled dairymen to supplement the pastures as much as possible with grains and mill feeds, despite their high cost. With the system of paying for milk according to fat coming more into favor, there is somewhat of a reaction in the matter of regarding the Holstein as the most favored dairy breed."

Poultry. November returns regarding the keeping of fowl upon the farm were to the following effect: "Opinions are very much divided as to the profits in poultry on the farm, owing to the high cost of grains. Some correspondents speak of a reduction in the size of flocks on this account, but others point to the encouraging prices prevailing all season for eggs, and insist that poultry keeping pays. More crate feeding than formerly is being practised. A large number of young turkeys died off in the cold, wet spring, but those remaining did well during the dry, hot summer, although there was a scarcity of insects for food. Some correspondents speak of the school fairs as helping the farm poultry industry."

Statistics. The following table gives the total numbers and value of the several classes of live stock and poultry on hand July 1st, 1916, together with live stock sold or slaughtered in the year preceding that date:

Live Stock.	Live stock on hand, July 1, 1916.		Sold or slaughtered in year ending June 30, 1916.	
	No.	Value.	No.	Value.
		$		$
Horses (all ages)	775,732	101,434,391	78,119	10,684,992
Cattle:—				
Milch cows	1,045,029	69,337,793	878,540	46,987,563
Other cattle	1,689,738	58,986,733		
Sheep and lambs	908,066	7,386,710	475,406	3,588,522
Swine (all ages)	1,735,254	18,790,755	2,105,621	33,671,966
Poultry (all kinds)	14,377,844	7,933,157	6,774,884	4,226,038
Totals:				
1916	.....	263,869,539	.....	99,159,081
1915	.....	254,982,332	.....	93,762,223
1914	.....	250,870,078	.....	93,017,235
1913	.....	237,591,885	.....	89,651,016
1912	.....	225,848,942	.....	84,982,339
1911	.....	214,720,424	.....	80,675,390
1910	.....	194,416,037	.....	71,833,731

The values for the several classes of poultry on hand July 1st, 1916, were as follows: Turkeys, $641,092; geese, $458,256; ducks, $309,190; other fowl, $6,524,619.

Value per Head. The following table gives the average value per head of live stock and poultry for 1915 and 1916, and at five-year intervals.

Live Stock.	Live stock on hand July 1.					Sold or slaughtered in year ending June 30.				
	1916	1915	1910	1905	1900	1916	1915	1910	1905	1900
	$	$	$	$	$	$	$	$	$	$
Horses (all ages).....	131	139	128	110	76	137	146	136	119	79
Cattle:—	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Milch cows	66 35	60 83	40 76	35 05	31 01	53 48	49 90	37 44	36 23	32 12
Other cattle	34 91	32 18	22 43	21 29	17 93					
Sheep and lambs.....	8 13	7 05	5 75	4 68	4 29	7 55	6 72	5 36	4 28	3 64
Swine (all ages).....	10 83	9 93	8 50	6 44	5 42	15 99	14 98	12 49	9 79	7 69
Poultry (all kinds) ...	55	54	43	34	29	62	62	51	39	37

LABOR, WAGES AND PRODUCTION.

"The enlistment of so many men from the farms," said the April bulletin, "and the enticing prices paid by factories making munitions and other military supplies, have caused a shortage of labor that is much felt in rural districts. Several correspondents state that in many cases there is only one man on each 100-acre farm; others say that on such farms there is only about one out of five that has a hired man left on it. In many instances women have had to assist in the field work. Much less fall wheat was sown in 1915, and a larger area than ever will be devoted to grass for hay and pasturing. About the usual acreage of spring grains will be grown; likely more oats. Corn and beans will also have a slightly increased area, prices for the latter having attracted attention. Canning crops will not be popular, as they usually require more attention. Wages are higher than ever, men asking and getting from $30 to $40 with board, and in some cases more. While some farmers are not optimistic over present conditions, others are full of confidence, especially where they can interchange help work with their neighbors."

August reports regarding farm labor were thus summarized: "On the whole there has been a scarcity of farm labor, which would have been felt more keenly but for the remarkably open weather prevailing during harvest. Soldiers on furlough were also helpful on many farms, but in some cases male help was so hard to find that farm women, girls and boys assisted in clearing the fields. As usual, some farmers relieved the strain by exchanging help. Wages for harvesting were higher than usual, running from $1.50 to $3.00 a day (with board), and from $25.00 to $45.00 a month, and even higher, according to the need of the occasion and the ability of the man."

The following appeared in the November bulletin: "Even with the comparatively light yield of grains, roots and corn there has been a scarcity of agricultural labor in almost every locality, attributed chiefly to heavy enlistments among young men on the farms. To meet this lack of help farmers have exchanged work more freely than ever, and the latest improved machinery was brought into use, while in many sections women were to be seen working in the fields more frequently than usual. As to the probable rise or fall in the matter of wages, several returns in almost identical terms state that farmers cannot afford to pay more for labor, and that men cannot afford to work for less; while one correspondent sums up the opinion of many regarding the greatest need of the present time as 'Patience until the war is over.' Domestic servants on the farm are almost impossible to find."

TEMPERATURE OF 1916.

TABLE I.—Showing for each month the highest, lowest, mean daily range and mean temperature at the principal stations in Ontario for 1916; also the annual mean for each station.

Months.	Southampton.	Chatham.	London.	Woodstock.	Stoney Creek.	Toronto.	Lindsay.	Gravenhurst.	Ottawa.	Haileybury.
	°	°	°	°	°	°	°	°	°	°
January:										
Highest	59.3	59.0	57.0	56.5	59.0	53.2	48.6	48.0	44.0	45.9
Lowest	1.2	1.0	— 4.0	— 3.0	1.0	0.9	—11.2	—18.0	—16.2	— 32.3
Daily range	15.1	12.4	15.5	15.6	13.8	14.1	17.9	18.6	19.4	21.6
Monthly mean	27.8	30.2	28.8	28.0	31.1	30.1	23.6	21.8	17.6	9.6
February:										
Highest	39.1	49.0	41.0	36.5	42.0	43.7	38.6	40.0	42.0	34.1
Lowest	—19.1	— 9.0	—16.0	—22.0	—10.0	— 9.3	—19.3	—27.0	—18.0	— 26.1
Daily range	15.9	17.0	16.0	14.9	15.0	14.3	18.0	18.2	15.6	18.6
Monthly mean	16.3	19.9	18.0	16.7	19.7	18.9	13.5	12.3	11.6	3.6
March:										
Highest	48.8	62.0	61.0	59.0	59.0	57.4	57.8	56.0	53.0	49.8
Lowest	— 8.8	1.0	— 6.0	— 7.5	— 4.0	— 2.4	—17.9	—22.0	—16.0	— 25.3
Daily range	17.0	17.6	19.0	16.6	16.5	15.3	21.4	21.4	20.1	21.3
Monthly mean	21.1	27.8	24.7	22.7	25.2	25.4	19.8	18.4	18.0	13.0
April:										
Highest	69.0	76.0	73.0	68.6	75.0	68.6	71.5	65.0	71.2	69.8
Lowest	21.1	24.0	21.0	23.7	28.0	25.3	21.2	15.0	20.0	8.0
Daily range	15.1	19.3	20.9	17.1	14.1	15.0	19.3	18.0	16.7	19.2
Monthly mean	41.3	46.6	45.0	43.4	43.9	44.4	43.8	41.0	43.5	38.1
May:										
Highest	75.9	83.0	82.0	75.9	81.0	81.4	77.6	74.0	80.0	82.4
Lowest	30.9	34.0	31.0	34.0	37.0	36.7	29.7	29.0	33.0	24.8
Daily range	18.2	21.4	21.6	18.9	19.6	19.0	21.5	20.2	17.6	18.8
Monthly mean	49.9	58.2	55.6	54.5	54.6	54.3	52.5	49.3	54.0	49.4
June:										
Highest	81.3	86.0	81.5	76.0	81.0	78.0	80.4	76.0	79.5	81.0
Lowest	35.6	42.0	39.0	39.8	40.0	39.8	35.6	33.0	42.0	38.0
Daily range	17.8	21.7	22.1	17.5	17.8	17.9	20.1	17.7	16.8	19.3
Monthly mean	57.5	64.7	60.9	59.6	59.4	60.1	59.5	58.1	61.7	59.3
July:										
Highest	89.5	102.0	100.0	95.0	98.0	100.2	98.2	92.0	97.0	99.5
Lowest	51.0	55.0	47.0	48.8	47.0	53.7	49.9	45.0	53.0	44.9
Daily range	18.5	26.7	27.0	20.9	20.2	21.1	26.0	23.6	20.3	25.0
Monthly mean	71.3	78.6	76.0	73.4	75.0	76.0	74.5	70.3	73.5	71.7
August:										
Highest	90.7	102.5	99.0	95.0	100.0	97.9	98.8	92.0	93.5	94.6
Lowest	45.7	51.0	45.0	43.0	48.0	46.0	44.8	38.0	46.0	46.1
Daily range	17.3	25.6	27.6	23.8	23.7	23.9	28.0	24.2	21.9	20.6
Monthly mean	68.5	75.0	71.2	69.3	72.3	72.0	69.9	66.1	69.3	67.3
September:										
Highest	86.1	95.0	90.0	84.8	92.0	89.8	86.3	81.0	83.0	75.0
Lowest	35.6	33.0	29.0	30.5	36.0	34.7	29.4	25.0	35.5	26.2
Daily range	16.3	21.2	22.1	17.2	20.8	20.1	22.6	20.2	17.6	16.5
Monthly mean	59.8	63.8	60.7	59.2	62.5	61.2	58.8	55.8	58.9	54.0
October:										
Highest	80.0	86.0	84.0	81.3	86.0	85.2	85.1	73.0	78.0	77.8
Lowest	29.6	30.0	27.0	26.3	26.0	29.7	25.0	23.0	26.5	20.6
Daily range	18.5	22.6	25.3	18.8	21.1	20.1	25.6	20.5	19.9	15.3
Monthly mean	48.1	52.1	48.0	47.5	49.8	49.6	47.7	44.3	45.9	40.8
November:										
Highest	65.0	69.0	67.0	63.0	69.0	63.8	63.1	66.0	63.0	55.2
Lowest	11.2	17.0	12.0	12.0	13.0	11.7	2.0	— 4.0	— 1.0	— 9.9
Daily range	12.5	15.3	15.0	14.1	13.6	13.8	16.7	15.6	14.0	12.7
Monthly mean	36.5	40.1	37.2	36.3	38.4	37.6	33.1	32.5	31.7	25.8
December:										
Highest	55.0	57.0	58.0	57.0	54.0	55.0	52.2	49.0	48.0	41.8
Lowest	3.7	— 2.0	— 4.0	0.0	4.0	4.9	— 9.1	—13.0	—20.0	— 24.5
Daily range	12.6	11.4	15.3	13.8	11.8	12.3	15.6	16.0	14.0	15.5
Monthly mean	25.7	26.4	23.8	23.7	26.3	26.9	20.3	19.5	17.4	10.6
Annual mean	43.6	48.6	45.8	44.5	46.5	46.4	43.1	40.8	41.9	36.9

AVERAGE TEMPERATURE FOR THIRTY-FIVE YEARS.

TABLE II.—Showing for each month the monthly average for the highest, lowest, mean daily range and the mean temperature at the principal stations in Ontario, derived from the thirty-five years, 1882-1916; also the annual mean at each station for the same period.

Months.	Southampton.	Chatham.	London.	Woodstock.	Stoney Creek.	Toronto.	Lindsay.	Gravenhurst.	Ottawa.	Haileybury.
January:	°	°	°	°	°	°	°	°	°	°
Highest	45.4	46.3	47.0	46.8	51.0	45.8	42.1	41.9	40.6	38.5
Lowest	— 6.5	— 8.9	—10.0	—11.0	— 4.5	— 7.1	—20.0	—27.3	—21.2	— 33.4
Daily range	14.6	12.0	15.1	16.4	14.3	14.5	17.8	20.6	17.9	23.7
Monthly mean	21.3	21.6	21.8	20.5	25.4	22.5	16.2	14.4	11.4	6.9
February:										
Highest	44.1	46.7	46.0	45.1	47.7	44.5	41.7	42.0	40.2	41.1
Lowest	—11.8	—10.9	—11.4	—12.0	— 6.5	— 8.1	—18.6	—27.6	—20.5	— 34.6
Daily range	16.9	13.9	16.7	17.1	15.4	15.3	19.6	22.3	18.4	23.3
Monthly mean	18.9	19.9	20.0	19.0	22.5	20.8	15.2	13.1	12.5	9.5
March:										
Highest	53.6	58.0	58.4	56.2	59.7	56.1	51.7	50.8	48.3	50.9
Lowest	— 3.0	— 1.2	— 0.4	— 1.2	5.3	3.9	— 6.7	—14.0	— 8.3	— 23.2
Daily range	17.1	14.8	17.5	17.3	15.1	14.5	18.5	21.4	17.5	25.8
Monthly mean	26.6	29.1	29.3	27.6	32.1	29.3	25.1	23.2	23.8	20.1
April:										
Highest	73.0	76.7	76.5	74.8	77.3	71.4	74.3	71.5	73.6	73.6
Lowest	16.3	18.3	18.5	17.4	23.1	21.3	14.1	11.0	15.3	6.4
Daily range	17.9	18.1	20.6	20.4	17.4	16.8	21.1	21.2	19.3	24.4
Monthly mean	40.6	43.5	43.3	42.4	44.5	42.7	41.6	39.4	41.2	38.6
May:										
Highest	80.2	82.3	82.8	80.8	84.5	79.7	82.5	81.0	82.7	84.1
Lowest	28.3	29.1	29.3	29.1	33.3	31.9	28.0	26.7	31.1	23.9
Daily range	19.7	20.8	22.7	22.1	20.3	19.1	23.8	23.0	22.0	26.4
Monthly mean	51.3	53.1	55.4	53.9	55.1	53.8	54.0	52.2	54.9	51.8
June:										
Highest	85.4	88.2	88.4	86.8	91.4	87.2	88.6	86.9	87.5	89.4
Lowest	37.2	37.4	37.7	38.2	41.8	42.2	38.7	35.9	41.7	33.5
Daily range	20.0	21.6	23.3	23.0	21.6	20.3	24.8	24.4	21.5	27.1
Monthly mean	60.5	64.3	64.7	63.3	65.9	63.8	63.5	62.2	64.6	61.6
July:										
Highest	87.2	92.1	92.1	89.9	95.2	91.2	91.7	89.4	90.9	91.6
Lowest	43.8	43.4	43.8	44.2	48.5	48.6	44.1	42.4	47.9	40.5
Daily range	20.3	22.0	23.1	23.4	21.8	20.3	24.5	23.4	20.5	25.7
Monthly mean	61.5	69.0	69.3	67.7	71.6	69.1	68.0	66.7	68.8	65.6
August:										
Highest	86.1	89.8	90.3	88.5	92.9	88.5	89.8	87.8	88.0	88.1
Lowest	41.8	42.3	40.7	41.4	46.0	46.2	40.4	38.5	43.5	37.4
Daily range	18.3	21.0	23.5	24.2	21.4	22.3	24.2	23.1	20.3	24.3
Monthly mean	64.7	66.7	66.5	64.9	69.2	65.6	65.4	64.3	65.8	62.7
September:										
Highest	85.0	87.1	86.9	85.6	90.2	85.2	86.0	83.9	84.1	83.7
Lowest	34.2	34.1	31.8	31.6	36.5	36.5	31.5	30.4	33.4	29.2
Daily range	18.4	19.6	22.4	22.4	20.8	18.7	22.8	22.0	19.9	23.2
Monthly mean	59.2	61.0	60.7	59.1	63.0	60.4	58.3	57.5	58.2	55.5
October:										
Highest	74.6	75.9	76.2	74.6	77.7	73.6	74.6	72.7	71.4	73.6
Lowest	25.6	25.2	23.7	23.5	26.3	26.4	21.4	21.3	24.5	17.9
Daily range	16.4	16.6	20.1	19.4	19.1	16.5	19.7	19.0	17.1	19.9
Monthly mean	48.1	49.1	48.3	47.0	51.1	48.6	46.3	45.9	45.9	43.5
November:										
Highest	61.4	63.0	62.3	61.6	65.4	60.1	59.3	59.0	58.0	56.2
Lowest	14.7	13.8	13.1	11.8	17.5	15.6	6.4	7.1	7.2	0.1
Daily range	13.2	12.1	14.8	15.0	14.3	12.9	15.1	14.7	12.1	14.8
Monthly mean	36.9	37.2	36.9	35.7	39.7	37.5	33.8	33.4	32.7	29.5
December:										
Highest	49.4	49.0	53.1	49.2	53.6	48.6	45.4	44.8	42.5	44.1
Lowest	0.6	— 0.4	— 2.3	— 3.1	— 0.9	— 0.6	—13.0	—14.4	—15.3	— 24.5
Daily range	12.6	10.7	13.3	13.9	13.1	12.7	15.7	16.8	15.0	19.3
Monthly mean	26.9	26.5	26.4	25.2	29.2	27.5	21.5	21.0	17.7	14.5
Annual mean	43.1	44.3	45.2	43.9	47.4	45.1	42.4	41.1	41.5	38.3

RAIN AND SNOW.

TABLE III.—Summary of the total fall of rain and snow, and the number of days on which rain and snow fell in Ontario during 1916, at stations reporting the whole year, and the average for the province.

Stations	Rain.		Snow.		Stations	Rain.		Snow.	
	Inches	Days	Inches	Days		Inches	Days	Inches	Days
ALGOMA:					MIDDLESEX:				
Biscotasing	23.26	76	75.3	44	London	29.19	95	103.0	50
Chapleau	20.24	81	95.0	33	Lucan	32.19	99	120.7	51
Steep Hill Falls	28.12	120	142.5	86	MUSKOKA:				
Ruel	27.34	70	78.2	31	Beatrice	32.33	86	133.0	38
BRANT:					NIPISSING:				
Paris	29.81	82	56.0	31	Haileybury	23.48	117	90.7	80
BRUCE:					Iroquois Falls	18.55	86	105.8	73
North Bruce	27.70	97	81.6	66	Madawaska	26.68	66	95.7	28
Southampton	30.25	124	130.8	84	Montreal River	18.74	65	57.5	27
Tobermory	29.06	82	69.0	21	North Bay	30.64	110	66.7	39
Walkerton	27.57	105	132.0	53	Sturgeon Falls	23.94	77	28.3	19
CARLETON:					NORFOLK:				
Ottawa	27.13	124	119.6	58	Port Dover	31.40	106	92.8	55
DUNDAS:					NORTHUMBERLAND:				
Morrisburg	35.97	67	128.1	43	Healy Falls	26.95	94	92.8	37
ELGIN:					ONTARIO:				
Dutton	31.48	89	27.2	16	Uxbridge	23.52	84	74.0	38
Port Stanley	35.30	136	81.6	67	OXFORD:				
ESSEX:					Woodstock	29.14	124	46.2	39
Cottam	26.00	70	42.7	30	PARRY SOUND:				
Windsor	28.10	80	42.0	23	Emsdale	35.25	114	72.3	46
FRONTENAC:					Nipissing	26.84	81	60.7	25
Kingston	31.54	114	58.8	55	Parry Sound	33.15	122	150.0	68
GREY:					PEEL:				
Markdale	26.16	69	142.1	34	Alton	27.28	91	79.5	42
Meaford	24.15	102	126.0	57	PERTH:				
HALTON:					Stratford	30.11	110	83.3	47
Georgetown	25.44	111	67.3	49	PETERBOROUGH:				
HASTINGS:					Peterborough	24.79	90	71.6	36
Queensboro'	22.51	99	91.0	21	PRESCOTT:				
Trenton	27.87	90	60.6	27	Vankleek Hill	21.32	54	96.5	18
HURON:					PRINCE EDWARD:				
Clinton	32.84	112	70.7	46	Bloomfield	23.99	80	78.5	28
Lucknow	29.39	112	109.4	70	Hillier	23.45	63	77.5	23
Ridgecrest (Goderich)	24.26	106	85.5	28	Picton	23.47	75	149.0	41
KENORA:					RAINY RIVER:				
Dryden	25.13	63	82.8	28	Ignace	24.25	59	171.3	31
KENT:					Lac Seul	17.59	80	57.1	42
Chatham	23.80	63	76.4	23	RENFREW:				
Wallaceburg	23.94	81	49.3	29	Clontarf	25.81	96	91.4	51
LANARK:					Pembroke	26.23	107	76.2	52
A monte	26.52	92	121.4	40	Renfrew	24.14	95	94.9	41
MacCue	26.97	57	63.0	12	Stonecliffe	24.07	114	67.4	56
LEEDS:					SIMCOE:				
Brockville	24.91	69	66.0	19	Barrie	22.36	135	125.5	91
Westport	29.79	58	76.0	30	Coldwater	23.51	97	96.0	47
LINCOLN:					Collingwood	14.22	63	60.1	37
Grimsby	27.40	77	34.0	30	SUDBURY:				
Port Dalhousie	23.38	90	57.1	39	Sudbury	27.33	104	37.6	30
					Wawaitin Falls	19.75	84	133.3	87
					White Fish Bay	17.21	61	88.6	42

RAIN AND SNOW—Continued.

TABLE III.—Continued.

Stations.	Rain		Snow		Stations.	Rain		Snow	
	Inches	Days	Inches	Days		Inches	Days	Inches	Days
THUNDER BAY:					WENTWORTH:				
Heron Bay	18.06	74	126.5	37	Stoney Creek	22.71	59	30.5	18
Kakabeka Falls	15.18	81	105.0	28					
Port Arthur	24.21	97	51.4	36	YORK:				
Quorn	15.63	30	92.0	22	Agincourt	25.48	80	62.1	35
VICTORIA:					Deer Park	21.72	80	61.9	36
Kinmount	26.38	88	95.5	49	Toronto	25.30	114	67.3	61
Lindsay	24.18	106	62.0	61	Wexford	25.28	90	67.0	30
WATERLOO:					Average for the				
Kitchener	28.00	96	31.1	28	Province: 1916..	25.70	90	82.7	42
WELLAND:					1915..	26.03	85	55.8	32
Welland	28.71	90	69.1	34	1914..	19.65	71	74.3	40
WELLINGTON:					1913..	25.73	79	53.9	30
Elora	26.70	90	64.0	47	1912..	27.09	85	78.0	40
Guelph	25.42	97	51.0	31	1912–1916..	24.84	82	68.9	37
Mount Forest	27.50	115	98.5	67	1882–1916..	24.20	84	72.5	40

RAIN AND SNOW.

TABLE IV. Monthly summary of inches of rain and snow in precipitation in the several districts of Ontario in 1916, also the average derived from the thirty-five years, 1882–1916.

Month.	West and South-west.		North and North-west.		Centre.		East and North-east.		The Province.	
	Rain.	Snow.	Rain.	Snow.	Rain.	Snow.	Rain.	Snow.	Rain.	Snow.
1916	in.	in.	in.	in.	in.	in.	in.	in.	in	in.
January	3.41	8.4	0.87	27.5	2.37	9.0	2.41	14.7	2.26	14.9
February	0.06	19.1	.....	11.4	.....	20.0	0.21	27.1	0.07	19.4
March	0.76	23.1	0.54	12.3	0.72	17.4	0.25	19.0	0.57	17.9
April	3.05	1.2	2.23	5.5	3.42	1.8	1.87	5.5	2.64	3.5
May	5.42	.....	2.95	1.1	4.55	.....	5.12	0.3	4.51	0.4
June	3.83	.....	3.03	.....	3.54	.....	4.70	.....	3.78	.....
July	0.78	.....	2.26	.....	1.00	.....	2.09	.....	1.53	.....
August	2.19	.....	2.68	.....	1.50	.....	1.58	.....	1.99	.....
September	2.31	.....	4.04	.....	2.19	.....	2.47	.....	2.75	.....
October	3.36	.....	3.00	12.5	3.65	.....	3.05	0.2	3.26	3.2
November	1.64	9.1	1.44	6.6	1.29	7.9	1.59	3.8	1.49	6.8
December	1.02	18.8	0.83	14.7	0.62	13.9	0.92	18.8	0.85	16.6
The Year	27.83	79.7	23.87	91.6	24.85	70.0	26.26	89.4	25.70	82.7
1882–1916										
January	1.26	15.3	0.71	24.5	1.13	17.1	0.98	20.0	1.02	19.2
February	1.14	13.4	0.46	19.4	0.88	14.9	0.62	16.6	0.78	16.1
March	1.34	8.7	0.91	12.9	1.28	9.9	1.10	11.1	1.16	10.7
April	1.99	1.9	1.56	3.7	1.97	2.7	1.60	3.2	1.78	2.9
May	3.21	.....	2.65	0.3	2.85	.....	2.73	0.1	2.86	0.1
June	2.87	.....	2.69	S	2.65	.....	2.77	.....	2.74	.....
July	2.63	.....	2.83	.....	2.80	.....	2.87	.....	2.78	.....
August	2.81	.....	2.82	.....	2.36	.....	2.71	.....	2.68	.....
September	2.56	.....	3.05	.....	2.35	.....	2.51	.....	2.62	.....
October	2.68	0.7	2.95	1.8	2.49	0.5	2.38	0.8	2.62	0.9
November	2.26	5.2	1.89	12.1	2.05	5.1	1.85	7.2	2.01	7.4
December	1.44	12.5	0.84	21.7	1.24	12.1	1.08	14.5	1.15	15.2
The Year	26.19	57.7	23.36	96.4	24.05	62.3	23.20	73.5	24.20	72.5

SUNSHINE.

TABLE V. Monthly summary of bright sunshine at the principal stations in Ontario for 1916. showing the number of hours the sun was above the horizon, the hours of registered sunshine, the total for the year, and the average derived from the thirty-five years, 1882-1916,

Month.	Sun above Horizon.	Woodstock.	Toronto.	Lindsay.	Kingston.	Ottawa.	Average of five stations.		
							1916	1915	1882–1916
1916	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.
January	285.7	58.5	75.4	63.5	74.3	87.4	71.8	73.1	.....
February	*302.5	83.7	90.9	79.6	114.6	114.4	96.6	92.7	.....
March	369.9	126.9	166.6	144.6	157.8	196.3	158.4	197.0	.....
April	406.4	135.0	175.5	128.9	155.3	176.0	154.1	186.9	.....
May	461.1	212.8	230.3	171.2	209.5	209.7	206.7	222.4	.....
June	465.7	230.3	200.9	152.2	182.2	194.2	192.0	267.4	.....
July	470.9	320.4	326.0	270.3	319.4	312.7	309.8	236.1	.....
August	434.5	285.2	286.8	235.4	291.4	276.6	275.1	194.4	.....
September	376.3	174.8	191.0	143.6	178.5	150.2	167.6	195.3	.....
October	340.2	160.7	159.1	128.0	160.5	166.2	154.9	146.9	.....
November	286.9	120.6	104.0	69.9	102.7	111.1	101.7	92.6	.....
December	274.3	83.9	73.5	56.0	64.4	86.0	72.8	64.3	.....
The Year	4,474.4	1,992.8	2,080.0	1,643.2	2,010.6	2,080.8	1,961.5	1,969.1	.....
1882–1916									
January	.....	61.7	76.6	74.2	76.5	85.7	.....	.....	74.9
February	.....	90.6	107.0	102.4	110.6	110.1	.....	.....	104.1
March	.....	125.0	152.5	148.1	148.0	149.8	.....	.....	144.7
April	.....	169.4	189.3	184.6	182.4	190.4	.....	.....	183.2
May	.....	209.6	222.6	209.0	207.7	207.3	.....	.....	211.2
June	.....	249.0	260.6	237.1	251.5	235.3	.....	.....	246.7
July	.....	274.6	283.9	253.8	271.7	255.5	.....	.....	267.9
August	.....	234.7	250.9	228.3	247.9	239.3	.....	.....	240.2
September	.....	175.6	208.0	187.0	187.8	171.4	.....	.....	186.0
October	.....	144.2	153.5	130.5	139.1	132.5	.....	.....	140.0
November	.....	75.9	84.0	72.1	79.9	85.4	.....	.....	79.5
December	.....	54.8	66.0	55.7	67.2	61.8	.....	.....	61.1
The Year	.....	1,865.1	2,054.9	1,882.8	1,970.3	1,924.5	.....	.....	1,939.5

*Leap year; in other years it is 291.4.

RURAL AREA ASSESSED.

TABLE VI.—Showing by County Municipalities the rural area of Ontario as returned by Municipal assessors for 1916; also the comparative totals for the Province for the five years, 1912-1916.

Counties and Districts.	Acres of assessed land.	Acres cleared.	Acres of woodland.	Acres of slash land.	Acres of swamp, marsh or waste land.	Per cent. cleared.
Algoma	305,080	50,147	213,932	11,748	29,253	16.44
Brant	215,712	179,990	9,442	17,086	9,194	83.44
Bruce	926,386	586,874	95,317	113,063	131,132	63.35
Carleton	560,766	370,773	49,195	96,761	44,037	66.12
Dufferin	354,979	275,971	13,799	27,529	37,680	77.74
Dundas	237,103	179,008	19,256	32,508	6,331	75.50
Durham	371,510	309,446	25,481	10,203	26,380	83.29
Elgin	435,815	362,021	45,087	23,459	5,248	83.07
Essex	425,282	358,401	22,911	35,241	8,729	84.27
Frontenac	699,446	260,678	73,057	167,575	198,136	37.27
Glengarry	287,520	195,578	53,541	18,916	19,485	68.02
Grenville	272,629	187,075	31,101	17,392	37,061	68.62
Grey	1,061,348	693,739	113,532	90,335	163,742	65.36
Haldimand	281,512	242,123	29,909	7,866	1,614	86.01
Haliburton	593,165	45,847	399,137	55,734	92,447	7.73
Halton	224,715	172,431	16,690	24,601	10,993	76.73
Hastings	1,077,623	447,818	252,782	221,219	155,804	41.56
Huron	798,991	665,469	48,853	31,792	52,877	83.27
Kenora	81,104	5,362	26,883	36,480	12,379	6.61
Kent	568,211	475,186	30,544	45,505	16,976	83.63
Lambton	659,339	506,507	65,375	76,228	11,229	76.82
Lanark	669,656	333,079	173,941	38,064	124,572	49.74
Leeds	472,304	271,670	101,200	34,697	64,737	57.52
Lennox & Addington	446,236	252,716	98,890	41,694	52,936	56.63
Lincoln	189,563	162,889	14,536	10,324	1,814	85.93
Manitoulin	288,876	48,028	57,191	94,485	89,172	16.63
Middlesex	756,197	662,808	60,612	18,583	14,194	87.65
Muskoka	561,197	68,822	306,552	82,917	102,906	12.27
Nipissing	329,175	57,050	200,580	7,458	64,087	17.33
Norfolk	396,846	281,843	56,109	31,951	26,943	71.02
Northumberland	437,017	349,266	36,873	19,720	31,158	79.92
Ontario	508,666	379,855	23,613	43,430	61,768	74.68
Oxford	470,343	400,066	33,246	19,806	17,225	85.06
Parry Sound	633,605	83,106	384,195	93,176	73,128	13.12
Peel	287,130	262,477	8,787	5,840	10,026	91.1
Perth	518,312	454,743	32,054	18,970	12,545	87.73
Peterborough	585,741	261,895	134,450	105,494	83,902	44.71
Prescott	293,763	207,495	32,179	40,670	13,419	70.63
Prince Edward	234,686	198,747	17,890	3,908	14,141	84.69
Rainy River	288,585	36,040	174,792	27,433	50,320	12.49
Renfrew	1,068,270	365,362	375,306	158,133	169,469	34.20
Russell	251,002	153,231	16,639	75,939	5,193	61.05
Simcoe	974,032	679,035	105,080	148,467	41,450	69.71
Stormont	248,455	157,047	34,306	44,933	12,169	63.21
Sudbury	386,099	56,347	175,794	23,997	129,961	14.59
Thunder Bay	498,143	35,142	187,613	218,960	56,428	7.05
Timiskaming	299,152	30,204	196,700	4,586	67,662	10.10
Victoria	595,008	286,610	35,723	142,381	130,294	48.17
Waterloo	307,935	253,355	32,013	6,796	15,771	82.28
Welland	226,175	186,359	17,134	13,228	9,454	82.40
Wellington	627,929	502,565	31,442	20,136	73,786	80.04
Wentworth	268,132	212,478	14,737	12,006	28,911	79.24
York	531,569	437,874	24,937	25,278	43,480	82.37
The Province.						
1916	25,088,035	14,698,648	4,830,938	2,794,701	2,763,748	58.59
1915	25,014,335	14,620,739	4,950,554	2,686,242	2,756,800	58.45
1914	24,935,350	14,595,068	5,066,783	2,487,396	2,786,103	58.53
1913	24,914,027	14,515,128	5,010,284	2,488,879	2,899,736	58.26
1912	24,799,117	14,447,258	5,366,855	2,366,337	2,718,666	58.26

FALL WHEAT AND SPRING WHEAT.

TABLE VII.—Showing by County Municipalities of Ontario the area, produce and market value of Fall Wheat and Spring Wheat for the year 1916, together with the comparative totals for the Province for 1914 and 1915, and the annual average for various periods.

Counties and Districts.	Fall Wheat.				Spring Wheat.			
	Acres.	Bushels.	Per acre.	Market value.	Acres.	Bushels.	Per acre.	Market value.
				$				$
Algoma	422	11,056	26.2	18,165	820	12,628	15.4	21,101
Brant	22,482	496,852	22.1	798,938	11	132	12.0	216
Bruce	31,857	726,340	22.8	1,183,208	3,393	44,448	13.1	70,228
Carleton	318	6,201	19.5	10,368	6,600	114,840	17.4	192,587
Dufferin	3,323	77,094	23.2	123,350	3,079	56,654	18.4	90,420
Dundas	432	9,634	22.3	15,414	1,272	22,769	17.9	37,660
Durham	10,129	248,161	24.5	415,918	7,432	126,344	17.0	203,161
Elgin	28,171	476,090	16.9	738,416	95	665	7.0	1,014
Essex	21,139	471,400	22.3	716,528	289	4,046	14.0	6,352
Frontenac	1,221	25,641	21.0	42,436	1,697	24,776	14.6	41,376
Glengarry	.....	.....	.....	.....	3,654	54,445	14.9	87,820
Grenville	85	1,386	16.3	2,310	888	15,096	17.0	25,829
Grey	19,781	472,766	23.9	786,210	4,914	75,676	15.4	122,444
Haldimand	27,568	485,197	17.6	766,611	348	4,594	13.2	7,548
Haliburton	.....	.....	.....	.....	267	4,139	15.5	6,734
Halton	14,969	254,473	17.0	428,024	943	11,316	12.0	18,819
Hastings	13,222	281,629	21.3	451,451	2,906	48,530	16.7	80,026
Huron	28,455	663,002	23.3	1,084,008	1,450	22,330	15.4	36,845
Kent	54,628	1,098,023	20.1	1,717,308	160	2,400	15.0	3,600
Lambton	33,196	736,951	22.2	1,171,752	275	4,125	15.0	6,394
Lanark	625	17,438	27.9	27,953	5,973	97,957	16.4	160,160
Leeds	1,411	31,183	22.1	48,770	1,735	27,066	15.6	42,900
Lennox and Add.	3,955	79,891	20.2	128,625	1,829	27,801	15.2	45,677
Lincoln	15,583	274,261	17.6	445,126	90	1,170	13.0	1,921
Manitoulin	387	8,591	22.2	13,746	2,180	34,444	15.8	54,800
Middlesex	42,380	864,552	20.4	1,348,701	185	3,145	17.0	4,821
Muskoka	31	372	12.0	614	237	3,887	16.4	6,515
Nipissing	10	173	17.3	260	1,016	18,694	18.4	30,471
Norfolk	31,023	589,437	19.0	944,278	.....	.....	.....	.....
Northumberland	15,823	370,258	23.4	620,923	6,192	87,926	14.2	143,056
Ontario	11,566	275,271	23.8	456,950	6,088	96,190	15.8	157,078
Oxford	27,141	597,102	22.0	935,659	140	2,240	16.0	3,510
Parry Sound	21	515	24.5	839	937	16,116	17.2	25,834
Peel	15,234	318,391	20.9	535,215	2,149	29,656	13.8	48,339
Perth	25,838	560,685	21.7	915,599	502	7,781	15.5	12,737
Peterborough	12,480	292,032	23.4	490,030	4,624	72,597	15.7	120,729
Prescott	87	1,262	14.5	2,051	3,176	38,430	12.1	67,445
Prince Edward	7,066	134,254	19.0	205,274	1,304	18,126	13.9	26,700
Rainy R. & Kenora	36	814	22.6	1,293	1,846	24,921	13.5	40,322
Renfrew	2,258	43,354	19.2	71,274	32,879	463,594	14.1	753,340
Russell	218	3,488	16.0	5,581	2,510	37,650	15.0	61,972
Simcoe	64,703	1,526,991	23.6	2,495,103	6,264	103,356	16.5	165,163
Stormont	97	2,056	21.2	3,207	1,445	23,843	16.5	36,957
Sudbury	119	2,083	17.5	3,402	1,046	18,723	17.9	29,545
Thunder Bay	90	1,800	20.0	2,880	737	13,045	17.7	22,177
Timiskaming	47	1,081	23.0	1,669	1,310	27,772	21.2	42,075
Victoria	5,956	147,709	24.8	242,390	6,703	97,194	14.5	150,942
Waterloo	27,413	641,464	23.4	1,024,418	76	1,140	15.0	1,805
Welland	21,088	343,734	16.3	560,974	25	300	12.0	480
Wellington	10,660	250,510	23.5	409,584	2,850	46,740	16.4	74,270
Wentworth	20,121	392,360	19.5	641,509	152	2,234	14.7	3,485
York	30,002	627,042	20.9	1,045,279	7,612	120,270	15.8	196,281
The Province:								
1916	704,867	14,942,050	21.2	24,099,591	144,305	2,213,961	15.3	3,591,681
1915	811,185	24,737,011	30.5	24,023,286	162,142	3,439,949	21.2	3,392,996
1914	685,692	14,333,548	20.9	15,641,232	118,607	2,169,425	18.3	2,340,520
Averages 10 years)								
1902 1911	720,272	16,912,017	23.5	14,142,444	182,335	3,269,976	17.9	2,655,591
1892-1901	930,794	18,688,313	20.1	12,650,091	356,355	5,405,846	15.2	3,650,840
1882-1891	902,846	18,059,235	20.0	16,250,884	563,547	8,882,998	15.8	7,959,306
Average (35 years)								
1882-1916	832,780	17,754,110	21.3	14,901,278	333,917	5,365,224	16.1	4,453,528

BARLEY AND OATS.

TABLE VIII.—Showing by County Municipalities of Ontario the area, produce and market value of Barley and Oats for the year 1916, together with the comparative totals for the Province for 1914 and 1915, and the annual averages for various periods.

Counties and Districts.	Barley.				Oats.			
	Acres.	Bushels.	Per acre.	Market value.	Acres.	Bushels.	Per acre.	Market value.
				$				$
Algoma	1,588	30,807	19.4	27,726	10,996	223,219	20.3	157,816
Brant	6,275	149,345	23.8	152,631	27,068	752,490	27.8	493,633
Bruce	23,056	562,566	24.4	574,380	114,699	3,108,343	27.1	2,007,990
Carleton	9,486	184,977	19.5	191,451	78,296	1,816,467	23.2	1,298,774
Dufferin	16,236	407,524	25.1	424,640	62,581	1,796,075	28.7	1,083,033
Dundas	4,961	112,119	22.6	113,016	30,195	776,012	25.7	585,889
Durham	11,093	296,183	26.7	324,024	56,534	1,735,594	30.7	1,100,367
Elgin	5,855	112,416	19.2	105,671	47,966	1,069,642	22.3	758,376
Essex	7,582	163,013	21.5	148,342	68,271	1,542,925	22.6	1,019,873
Frontenac	4,471	89,420	20.0	93,265	38,801	896,303	23.1	624,723
Glengarry	3,437	66,334	19.3	68,258	39,071	820,491	21.0	608,804
Grenville	1,560	36,816	23.6	40,203	32,881	861,482	26.2	624,574
Grey	31,634	781,360	24.7	779,016	153,544	4,253,169	27.7	2,658,231
Haldimand	5,691	92,763	16.3	90,258	33,765	786,725	23.3	539,693
Haliburton	805	17,952	22.3	18,580	9,777	231,715	23.7	158,030
Halton	7,379	146,104	19.8	166,559	29,065	674,308	23.2	458,529
Hastings	16,136	385,650	23.9	398,376	83,128	2,310,958	27.8	1,592,250
Huron	29,491	704,835	23.9	687,214	134,450	3,952,830	29.4	2,545,623
Kent	12,285	286,241	23.3	263,914	63,000	1,549,800	24.6	1,018,219
Lambton	14,079	284,396	20.2	275,295	73,169	1,697,521	23.2	1,154,314
Lanark	5,250	137,550	26.2	134,661	44,770	1,253,560	28.0	864,956
Leeds	3,499	70,680	20.2	73,083	42,030	1,017,126	24.2	713,005
Lennox and Add	8,138	183,105	22.5	187,133	33,827	845,675	25.0	591,127
Lincoln	1,642	33,497	20.4	32,124	19,660	475,772	24.2	316,864
Manitoulin	2,410	56,876	23.6	54,373	7,891	225,683	28.6	151,208
Middlesex	15,599	305,740	19.6	287,090	98,525	2,236,518	22.7	1,514,123
Muskoka	703	13,427	19.1	13,991	14,958	383,563	22.3	276,932
Nipissing	928	22,086	23.8	22,903	12,770	379,269	29.7	243,111
Norfolk	4,504	98,187	21.8	96,518	38,167	843,491	22.1	561,765
Northumberland	9,324	207,925	22.3	222,272	60,625	1,594,438	26.3	1,045,951
Ontario	22,004	576,505	26.2	620,319	83,256	2,547,634	30.6	1,569,343
Oxford	10,223	234,107	22.9	226,381	70,986	1,781,749	25.1	1,179,518
Parry Sound	1,404	33,275	23.7	35,737	21,590	593,725	27.5	422,138
Peel	18,497	373,639	20.2	405,772	50,234	1,381,435	27.5	888,263
Perth	26,741	673,873	25.2	670,504	101,651	2,947,879	29.0	1,945,600
Peterborough	8,376	232,853	27.8	240,537	53,032	1,622,779	30.6	996,386
Prescott	5,206	98,393	18.9	100,754	43,805	915,525	20.9	672,911
Prince Edward	8,445	154,544	18.3	160,108	25,536	587,328	23.0	401,732
Rainy R'r. & Kenora	1,394	35,547	25.5	31,246	7,145	204,347	28.6	138,139
Renfrew	5,915	111,202	18.8	100,304	67,471	1,814,970	26.9	1,157,951
Russell	3,415	65,568	19.2	66,748	30,871	737,817	23.9	509,832
Simcoe	54,065	1,389,471	25.7	1,429,766	141,383	4,184,937	29.6	2,594,661
Stormont	3,305	61,143	18.5	57,413	27,661	638,969	23.1	472,582
Sudbury	1,336	31,129	23.3	33,433	11,122	299,182	26.9	212,419
Thunder Bay	1,187	24,690	20.8	22,616	7,568	232,338	30.7	150,090
Timiskaming	958	27,878	29.1	26,540	7,591	250,503	33.0	173,348
Victoria	18,297	406,193	22.2	428,940	64,193	1,784,565	27.8	1,090,369
Waterloo	10,094	266,482	26.4	263,551	53,174	1,483,555	27.9	958,377
Welland	969	15,698	16.2	15,227	20,935	418,700	20.0	267,968
Wellington	25,381	637,063	25.1	663,183	108,654	2,879,331	26.5	1,986,738
Wentworth	5,803	134,630	23.2	138,669	32,334	856,851	26.5	564,665
York	29,774	765,192	25.7	817,225	99,090	3,022,245	30.5	1,985,615
The Province:								
1916	527,886	12,388,969	23.5	12,621,940	2,689,762	71,297,528	26.5	47,066,428
1915	552,318	19,893,129	36.0	11,130,811	2,871,555	120,217,952	41.9	47,452,121
1914	579,473	18,096,754	31.2	11,640,790	2,776,883	103,564,322	37.3	51,232,043
Averages (10 yrs.)								
1902-1911	711,199	21,709,056	30.5	10,870,736	2,703,900	98,968,442	36.6	36,309,289
1892-1901	498,932	13,100,823	26.3	5,037,346	2,291,902	79,229,462	34.6	22,119,649
1882-1891	743,245	19,349,351	26.0	10,547,091	1,663,205	58,410,603	35.1	21,017,492
Average (35 yrs.)								
1882-1916	641,842	17,984,554	28.0	9,182,257	2,292,276	81,658,188	35.6	28,987,497

PEAS AND BEANS.

TABLE IX.—Showing by County Municipalities of Ontario the area, produce and market value of Peas and Beans for the year 1916, together with the comparative totals for the Province for 1914 and 1915, and the annual averages for various periods.

Counties and Districts.	Peas.				Beans.			
	Acres.	Bushels.	Per acre.	Market value.	Acres.	Bushels.	Per acre.	Market value.
				$				$
Algoma	868	10,242	11.8	19,726	22	220	10.0	1,056
Brant	286	2,488	8.7	4,872	827	8,849	10.7	45,749
Bruce	5,772	66,955	11.6	145,962	252	3,226	12.8	15,872
Carleton	1,093	16,504	15.1	35,913	679	9,438	13.9	50,021
Dufferin	1,520	21,888	14.4	44,958	23	230	10.0	920
Dundas	316	4,329	13.7	7,623	298	4,828	16.2	24,912
Durham	6,101	76,263	12.5	160.305	666	7,659	11.5	38,908
Elgin	579	5,790	10.0	13,317	4,874	56,538	11.6	304,174
Essex	72	864	12.0	2,298	994	13,419	13.5	75,012
Frontenac	243	2,843	11.7	5,277	279	3,376	12.1	18,230
Glengarry	388	4,307	11.1	8,748	199	2,109	10.6	10,777
Grenville	75	1,305	17.4	2,691	360	4,716	13.1	25,372
Grey	5,565	73,458	13.2	159,845	161	1,369	8.5	6,544
Haldimand	616	6,160	10.0	12,757	254	1,981	7.8	10,143
Haliburton	226	210	14.0	411	.....	.....	.....	.....
Halton	791	7,119	9.0	15,662	165	1,650	10.0	9,075
Hastings	1,740	24,534	14.1	46,860	392	3,293	8.4	17,025
Huron	3,682	44,184	12.0	92,477	5,959	85,810	14.4	488,259
Kent	584	8,176	14.0	17,987	22,944	211,085	9.2	1,152,524
Lambton	511	6,132	12.0	9,198	1,100	12,650	11.5	64,642
Lanark	1,113	17,363	15.6	34,257	284	3,806	13.4	18,383
Leeds	397	5,002	12.6	9,794	319	3,828	12.0	20,250
Lennox and Add'ton	1,461	19,870	13.6	40,535	319	5,104	16.0	29,195
Lincoln	120	1,560	13.0	2,707	282	4,286	15.2	22,330
Manitoulin	1,364	19,096	14.0	39,758	39	390	10.0	2,145
Middlesex	686	6,174	9.0	10,422	1,388	18,460	13.3	100,238
Muskoka	663	8,288	12.5	17,479	22	220	10.0	1,100
Nipissing	1,045	18,183	17.4	37,584	15	225	15.0	1,085
Norfolk	1,261	11,349	9.0	24,310	1,774	17,020	9.6	89,748
Northumberland	2,803	33,075	11.8	67,572	936	10,858	11.6	57,873
Ontario	3,499	38,139	10.9	79,100	259	3,020	11.7	16,332
Oxford	224	2,240	10.0	4,446	189	2,457	13.0	12,531
Parry Sound	1,717	25,240	14.7	50,985	2	20	10.0	100
Peel	1,949	20,270	10.4	42,932	35	280	8.0	1,540
Perth	997	14,357	14.4	27,680	92	920	10.0	4,471
Peterborough	5,360	81,472	15.2	177,365	210	1,680	8.0	8,921
Prescott	638	7,911	12.4	20,474	370	4,218	11.4	22,482
Prince Edward	3,580	46,898	13.1	85,683	1,746	19,904	11.4	117,036
Rainy Riv. & Kenora	94	1,532	16.3	3,275	2	30	15.0	150
Renfrew	10,395	141,372	13.6	309,181	402	5,306	13.2	24,620
Russell	874	10,828	12.4	25,816	373	6,005	16.1	30,626
Simcoe	7,409	91,872	12.4	198,811	547	6,564	12.0	33,542
Stormont	174	2,575	14.8	4,282	232	3,480	15.0	18,896
Sudbury	946	13,622	14.4	30,459	19	152	8.0	669
Thunder Bay	191	3,686	19.3	7,593	16	160	10.0	800
Timiskaming	1,089	26,789	24.6	54,087	35	525	15.0	2,363
Victoria	5,968	89,520	15.0	194,616	166	1,992	12.0	10,836
Waterloo	826	11,564	14.0	21,185	39	273	7.0	1,229
Welland	52	520	10.0	812	2,674	22,194	8.3	134,496
Wellington	3,623	44,201	12.2	93,839	140	1,400	10.0	7,532
Wentworth	320	3,744	11.7	6,616	194	1,552	8.0	8,862
York	3,676	41,906	11.4	88,212	431	4,310	10.0	23,490
The Province:								
1916	95,542	1,243,979	13.4	2,618,754	53,999	583,105	10.8	3,183,086
1915	126,943	2,043,049	16.1	3,302,641	62,863	882,819	14.0	2,745,106
1914	177,856	2,609,585	14.7	3,565,974	51,149	835,895	16.3	1,787,432
Averages (10 years):								
1902-1911	389,104	7,056,642	18.1	5,275,196	50,006	854,999	17.1	1,263,012
1892-1901	759,819	14,242,404	18.5	7,613,480	51,654	875,597	17.0	818,381
1882-1891	668,962	13,908,658	20.8	8,573,501	26,201	469,393	17.9	545,087
Average 35 years):								
1882-1916	545,086	10,421,398	19.1	6,608,115	45,228	757,288	16.7	1,085,700

RYE AND BUCKWHEAT.

TABLE X.—Showing by County Municipalities of Ontario the area, produce and market value of Rye and Buckwheat for the year 1916, together with the comparative totals for the Province for 1914 and 1915, and the annual averages for various periods.

Counties and Districts.	Rye.				Buckwheat.			
	Acres.	Bushels.	Per acre.	Market value.	Acres.	Bushels.	Per acre.	Market value.
				$				$
Algoma	76	1,155	15.2	1,213	194	2,231	11.5	2,157
Brant	3,996	61,538	15.4	72,615	2,485	36,033	14.5	40,249
Bruce	1,740	27,840	16.0	31,292	4,658	83,378	17.9	89,798
Carleton	704	12,742	18.1	13,061	5,521	93,857	17.0	100,896
Dufferin	4,246	75,154	17.7	93,642	4,539	39,489	8.7	43,438
Dundas	699	12,442	17.8	15,254	5,424	113,362	20.9	116,083
Durham	13,093	205,560	15.7	258,183	6,404	87,735	13.7	101,860
Elgin	1,048	14,253	13.6	15,778	4,630	61,579	13.3	65,335
Essex	671	11,407	17.0	11,761	2,485	28,329	11.4	29,547
Frontenac	1,532	22,827	14.9	28,374	3,974	55,636	14.0	62,424
Glengarry	.....	.....	.....	.....	2,633	47,921	18.2	47,921
Grenville	1,236	22,495	18.2	28,344	5,142	97,184	18.9	104,473
Grey	610	10,065	16.5	9,059	6,684	98,255	14.7	96,978
Haldimand	290	4,698	16.2	5,365	3,006	18,036	6.0	20,226
Haliburton	398	6,607	16.6	7,624	642	9,052	14.1	10,156
Halton	289	4,335	15.0	5,332	1,328	15,139	11.4	17,410
Hastings	11,025	185,220	16.8	213,003	10,887	178,547	16.4	190,510
Huron	1,488	26,338	17.7	31,158	8,681	143,237	16.5	150,399
Kent	1,008	14,112	14.0	15,368	2,904	45,012	15.5	44,472
Lambton	302	4,681	15.5	4,447	1,224	16,524	13.5	15,004
Lanark	2,131	39,637	18.6	43,482	4,759	81,379	17.1	78,531
Leeds	1,842	30,393	16.5	35,438	4,694	67,594	14.4	71,582
Lennox & Adding'n	2,993	50,282	16.8	60,690	6,790	103,887	15.3	120,093
Lincoln	409	6,012	14.7	6,577	988	15,314	15.5	18,224
Manitoulin	315	5,450	17.3	5,537	160	3,520	22.0	3,168
Middlesex	1,295	21,238	16.4	23,234	1,615	22,933	14.2	25,685
Muskoka	326	5,151	15.8	6,181	312	3,806	12.2	4,472
Nipissing	114	2,052	18.0	2,142	228	4,264	18.7	4,699
Norfolk	10,792	156,484	14.5	191,849	10,457	112,936	10.8	136,991
Northumberland	16,459	243,593	14.8	302,543	15,294	232,469	15.2	268,502
Ontario	9,113	151,276	16.6	185,313	10,356	157,411	15.2	181,967
Oxford	1,509	22,937	15.2	26,882	5,189	79,392	15.3	85,585
Parry Sound	227	3,814	16.8	4,531	107	1,338	12.5	1,382
Peel	3,985	64,956	16.3	75,869	2,409	14,454	6.0	16,232
Perth	24	384	16.0	346	3,517	50,293	14.3	50,293
Peterborough	5,552	89,942	16.2	107,751	6,320	87,216	13.8	100,996
Prescott	203	2,538	12.5	2,792	1,639	22,946	14.0	27,994
Prince Edward	6,691	95,681	14.3	113,956	8,829	108,597	12.3	127,167
Rainy R'r & Kenora	144	3,456	24.0	3,974	9	162	18.0	162
Renfrew	9,870	143,115	14.5	159,573	2,581	37,166	14.4	32,892
Russell	79	1,185	15.0	1,173	1,508	29,406	19.5	31,259
Simcoe	15,768	258,595	16.4	310,831	17,917	252,630	14.1	267,030
Stormont	88	1,434	16.3	1,569	2,663	58,320	21.9	65,318
Sudbury	50	1,000	20.0	1,100	130	2,600	20.0	3,078
Thunder Bay	117	2,925	25.0	2,925	32	480	15.0	480
Timiskaming	.....	.....	.....	.....	14	210	15.0	210
Victoria	2,654	42,199	15.9	48,276	6,628	79,536	12.0	87,808
Waterloo	3,399	56,763	16.7	61,985	3,364	39,022	11.6	40,349
Welland	166	2,141	12.9	2,381	3,547	24,829	7.0	28,777
Wellington	1,539	28,472	18.5	32,600	9,237	90,523	9.8	96,588
Wentworth	547	8,369	15.3	9,256	2,295	31,442	13.7	33,580
York	5,886	89,467	15.2	105,661	12,172	175,277	14.4	195,259
The Province:								
1916	148,738	2,354,410	15.8	2,797,290	229,205	3,261,888	14.2	3,555,699
1915	173,736	3,210,512	18.5	2,532,051	193,497	4,278,366	22.1	3,057,398
1914	138,913	2,315,532	16.7	1,965,522	177,227	4,251,421	24.0	3,041,564
Averages (10 years)								
1902-1911	112,424	1,877,432	16.7	1,129,754	131,168	2,871,668	21.9	1,503,428
1892-1901	129,188	2,088,786	16.2	937,885	131,005	2,450,389	18.7	949,189
1882-1891	103,636	1,683,211	16.2	1,010,057	69,230	1,413,900	20.4	586,472
Average (35 years)								
1882-1916	118,235	1,948,406	16.5	1,161,981	124,232	2,530,813	20.4	1,301,284

CORN.*

TABLE XI.—Showing by County Municipalities of Ontario, the area, produce and market value of Corn for husking and for fodder for the year 1916, together with the comparative totals for the Province for 1914 and 1915 and the annual averages for various periods.

Counties and Districts.	Corn for husking.				Corn for Silo.			
	Acres.	Bushels.	Per acre.	Market Value.	Acres.	Tons green.	Per acre.	Market value.
				$				$
Algoma	62	1,860	30.0	1,572	216	1,601	7.41	5,203
Brant	3,227	138,761	43.0	100,324	7,214	53,095	7.36	172,559
Bruce	320	13,856	43.3	10,156	13,639	107,748	7.90	350,181
Carleton	554	16,620	30.0	14,725	17,404	156,636	9.00	509,067
Dufferin	75	3,000	40.0	2,385	2,129	14,243	6.69	46,290
Dundas	1,468	73,400	50.0	70,464	10,668	90,998	8.53	295,744
Durham	1,144	51,480	45.0	39,022	11,172	83,790	7.50	272,318
Elgin	19,520	1,022,848	52.4	785,547	15,632	95,980	6.14	311,935
Essex	78,111	3,733,706	47.8	2,669,600	4,153	34,428	8.29	111,891
Frontenac	1,842	81,048	44.0	68,242	5,134	35,476	6.91	115,297
Glengarry	748	29,920	40.0	23,038	6,043	57,106	9.45	185,595
Grenville	2,406	100,811	41.9	99,500	6,618	60,025	9.07	195,081
Grey	417	19,474	46.7	15,190	15,558	108,906	7.00	353,945
Haldimand	2,075	99,393	47.9	75,837	4,117	19,350	4.70	62,888
Haliburton	166	6,640	40.0	5,093	175	1,335	7.63	4,339
Halton	265	7,950	30.0	5,963	4,905	32,177	6.56	104,575
Hastings	4,907	215,417	43.9	190,859	12,086	77,350	6.40	251,388
Huron	949	47,450	50.0	39,526	17,363	146,891	8.46	477,396
Kent	58,523	3,236,322	55.3	2,359,279	8,376	66,338	7.92	215,599
Lambton	19,735	1,103,187	55.9	756,786	17,864	118,796	6.65	386,087
Lanark	996	34,860	35.0	29,666	9,808	92,686	9.45	301,230
Leeds	2,467	104,601	42.4	89,120	7,693	59,544	7.74	193,518
Lennox & Addingt'n.	1,759	70,360	40.0	60,228	4,813	33,498	6.96	108,869
Lincoln	3,004	124,666	41.5	100,605	3,057	17,089	5.59	55,539
Manitoulin	124	4,960	40.0	3,968	763	6,241	8.18	20,283
Middlesex	12,942	572,076	44.2	454,197	26,550	218,772	8.24	711,009
Muskoka	150	5,625	37.5	5,186	607	3,490	5.75	11,343
Nipissing	60	2,400	40.0	2,160	154	1,483	9.63	4,820
Norfolk	13,331	590,563	44.3	415,756	10,068	59,200	5.88	192,400
Northumberland	2,889	144,450	50.0	113,682	11,576	77,212	6.67	250,939
Ontario	692	33,424	48.3	24,934	15,270	116,516	7.63	378,658
Oxford	3,879	167,961	43.3	119,420	31,216	239,739	7.68	779,152
Parry Sound	51	2,040	40.0	1,822	307	2,303	7.50	7,485
Peel	122	6,100	50.0	5,411	6,016	41,089	6.83	133,539
Perth	1,123	44,920	40.0	31,309	16,779	120,305	7.17	390,991
Peterborough	344	13,760	40.0	12,412	7,876	68,679	8.72	223,207
Prescott	1,356	56,545	41.7	51,456	6,482	47,902	7.39	155,682
Prince Edward	3,763	185,892	49.4	155,220	5,895	32,246	5.47	104,800
Rainy R'r & Kenora	21	630	30.0	473	40	280	7.00	910
Renfrew	495	14,850	30.0	14,850	8,101	68,696	8.48	223,262
Russell	714	35,700	50.0	29,488	5,713	49,874	8.73	162,091
Simcoe	1,291	54,868	42.5	42,084	15,439	111,006	7.19	360,770
Stormont	1,716	81,167	47.3	67,693	6,852	67,287	9.82	218,683
Sudbury	29	870	30.0	783	130	780	6.00	2,535
Thunder Bay	8	240	30.0	180	85	649	7.63	2,109
Timiskaming	.....	.....	....	.....	2	12	6.00	39
Victoria	336	10,080	30.0	8,739	9,223	61,886	6.71	201,130
Waterloo	648	19,440	30.0	14,522	11,275	65,508	5.81	212,901
Welland	6,158	274,031	44.5	215,114	4,691	21,110	4.50	68,608
Wellington	123	4,920	40.0	3,774	9,999	75,392	7.54	245,024
Wentworth	938	37,520	40.0	27,877	6,997	45,481	6.50	147,813
York	289	14,450	50.0	10,823	15,468	107,967	6.98	350,893
The Province:								
1916	258,332	12,717,072	49.2	9,446,060	439,411	3,276,185	7.46	10,647,610
1915	309,773	21,760,496	70.2	9,885,292	443,736	4,874,377	10.98	12,185,943
1914	290,817	23,232,360	80.0	10,622,455	418,105	4,751,223	11.36	11,878,058
Averages (10 yrs.)								
1902-1911	325,515	22,988,755	70.6	8,780,681	236,330	2,731,936	11.56	5,652,083
1892-1901	294,076	21,218,057	72.2	5,314,705	157,611	1,777,533	11.28	3,555,065
Average (25 years).								
1892-1916	306,238	21,758,461	71.1	7,544,631	240,271	2,641,016	10.99	5,874,218

* The combined average of corn for the ten years 1882-1891 is 195,878 acres, the average value of the produce for the same period being $3,704,614. The combined average for corn for the thirty-five years 1882-1916 is 446,329 acres, the average value of the produce for the same period being $10,643,353.

POTATOES AND CARROTS.

TABLE XII.—Showing by County Municipalities of Ontario, the area, produce and market value of Potatoes and Carrots for the year 1916, together with the comparative totals for the Province for 1914 and 1915, and the annual averages for the various periods.

Counties and Districts.	Potatoes				Carrots.			
	Acres.	Bushels.	Per acre.	Market value.	Acres.	Bushels.	Per acre.	Market value.
				$				
Algoma	1,249	146,133	117	188,658	34	6,800	200	952
Brant	2,297	82,692	36	122,301	23	2,300	100	322
Bruce	4,187	221,911	53	291,369	71	9,159	129	1,282
Carleton	4,422	265,320	60	332,977	91	11,739	129	1,643
Dufferin	2,705	119,020	44	149,132	19	1,900	100	266
Dundas	1,633	68,586	42	86,693	24	2,208	92	309
Durham	2,864	131,744	46	185,627	37	5,550	150	777
Elgin	2,578	134,056	52	189,823	26	6,188	238	866
Essex	3,195	137,385	43	192,751	36	7,200	200	1,008
Frontenac	2,864	108,832	38	165,969	57	6,270	110	878
Glengarry	2,158	148,902	69	171,833	65	6,500	100	910
Grenville	2,416	140,128	58	170,816	80	16,000	200	2,240
Grey	5,142	287,952	56	372,322	69	9,177	133	1,285
Haldimand	1,213	31,538	26	46,613	12	1,200	100	168
Haliburton	609	43,239	71	51,325	15	3,000	200	420
Halton	1,159	46,360	40	70,421	5	500	100	70
Hastings	4,690	225,120	48	322,372	61	8,235	135	1,153
Huron	3,274	173,522	53	234,602	51	5,100	100	714
Kent	3,026	157,352	52	219,978	55	13,750	250	1,925
Lambton	2,601	130,050	50	179,859	55	5,500	100	770
Lanark	1,966	117,960	60	151,461	27	2,160	80	302
Leeds	2,406	91,428	38	126,262	40	4,600	115	644
Lennox & Addingt'n.	2,518	113,310	45	163,846	260	13,780	53	1,929
Lincoln	1,248	41,184	33	60,252	66	12,540	190	1,755
Manitoulin	610	46,970	77	58,853	36	7,200	200	1,008
Middlesex	6,277	332,681	53	460,098	22	3,520	160	493
Muskoka	1,230	68,880	56	92,230	38	5,434	143	760
Nipissing	1,109	166,350	150	192,633	29	5,800	200	812
Norfolk	3,199	137,557	43	182,125	60	7,500	125	1,050
Northumberland	3,941	130,053	33	191,698	54	7,398	137	1,035
Ontario	3,956	197,800	50	261,492	23	3,450	150	483
Oxford	2,387	90,706	38	124,267	37	3,700	100	518
Parry Sound	1,353	142,065	105	176,729	31	6,200	200	868
Peel	2,199	98,955	43	130,423	104	15,600	150	2,184
Perth	2,732	147,528	54	210,080	4	600	150	84
Peterborough	2,602	117,090	45	164,277	4	628	157	88
Prescott	2,211	123,816	56	156,999	44	7,920	180	1,109
Prince Edward	1,743	47,061	27	67,250	18	2,340	130	328
Rainy R'r & Kenora	860	159,960	186	154,681	11	2,750	250	385
Renfrew	3,749	299,920	80	338,910	85	12,155	143	1,702
Russell	1,392	82,128	59	99,539	51	6,375	125	893
Simcoe	9,277	482,404	52	610,241	116	22,504	194	3,151
Stormont	1,653	105,792	64	146,310	27	3,159	117	442
Sudbury	1,251	150,120	120	185,098	52	6,500	125	910
Thunder Bay	1,473	257,775	175	252,104	33	7,920	240	1,109
Timiskaming	749	100,366	134	110,102	25	3,125	125	438
Victoria	1,945	83,635	43	118,678	32	2,400	75	336
Waterloo	2,727	95,445	35	136,391	5	500	100	70
Welland	2,317	46,340	20	69,186	20	2,000	100	280
Wellington	5,011	215,473	43	299,292	39	7,800	200	1,092
Wentworth	3,177	120,726	38	173,483	33	6,600	200	924
York	5,973	197,109	33	273,784	79	8,690	110	1,217
The Province:								
1916	139,523	7,408,429	53	9,684,215	2,391	331,124	138	46,357
1915	173,934	13,267,023	76	10,805,026	2,439	686,232	281	85,779
1914	167,591	26,717,587	158	11,747,332	2,448	766,170	313	95,771
Averages (10 yrs.)								
1902-1911	153,092	17,355,152	113	8,928,246	5,243	1,688,002	322	211,000
1892-1901	164,451	18,304,638	111	6,150,629	11,163	3,880,538	348	485,068
1882-1891	155,449	18,840,683	121	8,476,165	10,243	3,659,347	351	457,417
Average (35 yrs.)								
1882-1916	157,986	18,079,094	114	8,385,877	8,020	2,725,760	340	340,862

MANGELS AND TURNIPS.

TABLE XIII. Showing by County Municipalities of Ontario the area, produce and market value of Mangels and Turnips for the year 1916, together with the comparative totals for the Province for 1914 and 1915, and the annual averages for various periods.

Counties and Districts.	Mangels.				Turnips.			
	Acres.	Bushels.	Per Acre.	Market value.	Acres.	Bushels.	Per Acre.	Market value.
				$				$
Algoma	22	4,620	210	647	434	104,160	240	14,582
Brant	1,044	267,264	256	37,417	2,871	717,750	250	100,485
Bruce	2,963	749,639	253	104,949	2,928	761,280	260	106,579
Carleton	341	73,315	215	10,264	1,834	465,836	254	65,217
Dufferin	338	43,940	130	6,151	2,405	521,885	217	73,064
Dundas	75	11,400	152	1,596	157	25,434	162	3,561
Durham	1,511	377,750	250	52,885	3,726	998,568	268	139,800
Elgin	359	89,750	250	12,565	133	29,393	221	4,115
Essex	418	124,564	298	17,439	76	19,000	250	2,660
Frontenac	95	11,590	122	1,622	426	67,308	158	9,423
Glengarry	125	18,750	150	2,625	483	72,933	151	10,211
Grenville	100	21,000	210	2,940	251	61,495	245	8,609
Grey	2,039	487,321	239	68,225	4,135	1,112,315	269	155,724
Haldimand	199	20,895	105	2,925	77	13,090	170	1,833
Haliburton	24	5,520	230	773	238	68,306	287	9,563
Halton	1,091	196,380	180	27,493	963	176,229	183	24,672
Hastings	246	31,980	130	4,477	1,588	368,416	232	51,578
Huron	4,309	1,197,902	278	167,706	4,116	1,251,264	304	175,177
Kent	534	154,326	289	21,606	96	33,600	350	4,704
Lambton	700	161,700	231	22,638	126	13,356	106	1,870
Lanark	191	46,413	243	6,498	1,060	310,580	293	43,481
Leeds	360	62,640	174	8,770	816	180,336	221	25,247
Lennox & Addingt'n	136	12,784	94	1,790	203	32,886	162	4,604
Lincoln	227	41,541	183	5,816	90	19,980	222	2,797
Manitoulin	87	16,965	195	2,375	327	98,100	300	13,734
Middlesex	1,202	370,216	308	51,830	1,983	577,053	291	80,787
Muskoka	72	17,640	245	2,470	517	109,087	211	15,272
Nipissing	37	8,658	234	1,212	404	121,200	300	16,968
Norfolk	329	75,999	231	10,640	951	159,768	168	22,368
Northumberland	876	192,720	220	26,981	4,026	1,026,630	255	143,728
Ontario	2,380	604,520	254	84,633	8,845	2,715,415	307	380,158
Oxford	1,629	307,881	189	43,103	4,958	951,936	192	133,271
Parry Sound	50	20,000	400	2,800	837	301,320	360	42,185
Peel	605	94,985	157	13,298	944	209,568	222	29,339
Perth	3,315	793,915	241	111,848	3,572	943,008	264	132,021
Peterborough	794	202,470	255	28,346	2,512	753,600	300	105,504
Prescott	110	18,370	167	2,572	366	55,266	151	7,737
Prince Edward	159	32,436	204	4,541	99	14,652	148	2,051
Rainy R'r & Kenora	38	12,198	321	1,708	177	62,835	355	8,797
Renfrew	210	30,870	147	4,322	877	197,325	225	27,626
Russell	80	17,360	217	2,430	580	145,000	250	20,300
Simcoe	2,846	651,734	229	91,243	5,859	1,546,776	264	216,549
Stormont	121	22,143	183	3,100	137	41,100	300	5,754
Sudbury	66	11,550	175	1,617	552	165,600	300	23,184
Thunder Bay	56	15,680	280	2,195	448	179,200	400	25,088
Timiskaming	29	8,700	300	1,218	285	85,500	300	11,970
Victoria	748	157,080	210	21,991	3,476	1,021,944	294	143,072
Waterloo	2,635	397,885	151	55,704	3,947	888,075	225	124,331
Welland	138	24,840	180	3,478	63	9,450	150	1,323
Wellington	2,748	599,064	218	83,869	9,212	2,689,904	292	376,587
Wentworth	1,022	245,280	240	34,339	2,007	471,645	235	66,030
York	2,964	586,872	198	82,162	4,477	1,101,342	246	154,188
The Province:								
1916	42,793	9,756,015	228	1,365,842	91,670	24,067,699	263	3,369,478
1915	50,799	25,356,323	498	2,028,505	97,451	46,598,851	478	4,659,885
1914	50,663	25,439,520	502	2,035,162	95,371	46,336,708	486	4,633,671
Averages (10 years)								
1902–1911	70,809	33,245,680	470	2,659,654	123,855	54,987,697	444	5,498,770
1892–1901	39,984	17,864,726	447	1,429,178	147,080	63,424,431	431	6,342,443
1882–1891	19,546	8,538,096	437	683,048	104,943	42,981,280	410	4,298,128
Average (35 years)								
1882–1916	44,638	20,189,824	452	1,631,910	121,210	52,068,251	430	5,234,331

SUGAR BEETS—MIXED GRAINS.

TABLE XIV.—Showing by County Municipalities of Ontario the area, produce and market value of Sugar Beets and Mixed Grains for the year 1916, together with the comparative totals for the Province for the past eight years, and the annual average for 1907-1916.

Counties and Districts.	Sugar Beets.				Mixed Grains.			
	Acres.	Bushels.	Per acre.	Market value.	Acres.	Bushels.	Per acre.	Market value.
				$				$
Algoma	6	798	133	112	779	17,761	22.8	16,766
Brant	166	41,500	250	5,810	5,139	154,170	30.0	140,295
Bruce	219	40,953	187	5,733	23,728	683,366	28.8	646,464
Carleton	275	55,275	201	7,738	13,490	329,156	24.4	318,952
Dufferin	231	34,650	150	4,851	13,227	371,679	28.1	336,741
Dundas	120	16,920	141	2,369	11,076	281,330	25.4	254,322
Durham	67	13,400	200	1,876	22,770	648,945	28.5	650,892
Elgin	164	32,800	200	4,592	8,353	182,931	21.9	159,516
Essex	1,513	425,153	281	59,521	2,366	61,516	26.0	67,668
Frontenac	109	15,369	141	2,151	3,105	78,557	25.3	76,593
Glengarry	97	11,349	117	1,589	4,269	82,819	19.4	70,396
Grenville	129	24,252	188	3,395	6,298	159,969	25.4	146,372
Grey	522	129,978	249	18,197	23,192	679,526	29.3	585,072
Haldimand	51	5,916	116	828	4,771	104,962	22.0	90,582
Haliburton	36	7,668	213	1,074	226	5,673	25.1	5,463
Halton	110	22,000	200	3,080	6,797	167,886	24.7	170,236
Hastings	167	20,875	125	2,923	6,182	159,496	25.8	163,483
Huron	347	90,567	261	12,679	23,602	691,539	29.3	605,097
Kent	9,256	3,221,088	348	450,952	6,272	149,274	23.8	139,273
Lambton	1,803	416,493	231	58,309	10,019	220,418	22.0	183,608
Lanark	103	24,720	240	3,461	5,523	161,824	29.3	158,588
Leeds	115	15,870	138	2,222	6,056	133,232	22.0	136,296
Lennox and Add.	109	8,502	78	1,190	5,758	134,161	23.3	143,150
Lincoln	178	27,946	157	3,912	2,168	52,682	24.3	43,463
Manitoulin	72	15,480	215	2,167	2,124	61,171	28.8	59,581
Middlesex	270	76,950	285	10,773	13,113	300,288	22.9	259,749
Muskoka	55	9,625	175	1,348	478	11,998	25.1	10,798
Nipissing	29	3,335	115	467	1,531	45,777	29.9	40,146
Norfolk	106	19,716	186	2,760	5,081	127,025	25.0	125,501
Northumberland	63	7,245	115	1,014	10,239	273,381	26.7	290,331
Ontario	191	32,661	171	4,573	31,017	977,036	31.5	1,016,117
Oxford	477	70,596	148	9,883	19,423	530,248	27.3	462,376
Parry Sound	15	4,500	300	630	1,231	30,652	24.9	31,817
Peel	113	18,080	160	2,531	9,326	221,959	23.8	229,284
Perth	758	184,194	243	25,787	24,115	730,685	30.3	645,926
Peterborough	48	11,616	242	1,626	3,872	108,029	27.9	108,029
Prescott	44	8,976	204	1,257	1,291	25,562	19.8	22,852
Prince Edward	75	11,025	147	1,544	2,807	58,947	21.0	59,890
Rainy R. & Kenora	12	3,720	310	521	320	8,800	27.5	7,260
Renfrew	112	12,096	108	1,693	5,587	135,205	24.2	117,223
Russell	25	4,575	183	641	3,139	73,767	23.5	70,226
Simcoe	710	148,390	209	20,775	19,696	569,214	28.9	599,382
Stormont	68	14,756	217	2,066	5,567	131,381	23.6	113,645
Sudbury	15	2,550	170	357	938	24,576	26.2	23,151
Thunder Bay	24	4,800	200	672	486	14,580	30.0	11,664
Timiskaming	17	5,100	300	714	533	18,868	35.4	18,868
Victoria	143	20,735	145	2,903	13,423	387,925	28.9	384,434
Waterloo	1,990	390,040	196	54,606	22,098	638,632	28.9	562,635
Welland	80	11,040	138	1,546	1,963	33,567	17.1	30,143
Wellington	536	137,216	256	19,210	41,709	1,184,536	28.4	1,054,237
Wentworth	196	42,924	219	6,009	6,984	169,711	24.3	164,789
York	345	47,955	139	6,714	22,729	690,962	30.4	655,723
The Province:								
1916	22,482	6,023,938	268	843,351	485,986	13,297,254	27.4	12,485,065
1915	22,890	8,644,281	378	1,080,535	475,738	19,461,609	40.9	10,602,271
19	18,534	7,466,819	403	933,352	456,631	16,854,550	36.9	10,074,687
1	19,083	6,389,177	335	798,647	414,517	15,113,480	36.5	7,953,111
19	21,054	7,819,066	371	977,383	448,402	16,382,161	36.5	8,674,724
19	24,664	8,941,659	363	1,117,707	486,112	14,845,595	30.5	9,104,141
19	26,879	11,238,577	418	1,348,629	497,936	18,261,803	36.7	9,187,822
1909	19,812	7,001,565	353	840,188	474,530	16,199,434	34.1	8,825,196
Average (10 years) 1907-1916	20,970	7,876,687	376	976,881	463,900	15,997,285	34.5	9,316,329

HAY AND CLOVER—ALL FIELD CROPS.

TABLE XV.—Showing by County Municipalities of Ontario the area, produce, and market value of Hay and Clover, and all field crops enumerated in Tables VII and XV for the year 1916, together with the comparative totals for the Province for 1914 and 1915, and the annual averages for various periods.

Counties and Districts.	Hay and Clover.				All Field Crops.		
	Acres.	Tons.	Per acre.	Market value.	Acres.	Value.	Per acre.
				$		$	$ c.
Algoma	20,760	38,437	1.85	434,722	38,548	912,174	23 66
Brant	42,468	103,506	2.44	1,100,269	127,879	3,388,685	26 50
Bruce	138,329	265,281	1.92	2,416,710	371,811	8,052,153	21 66
Carleton	96,245	195,973	2.04	2,042,039	237,353	5,195,693	21 89
Dufferin	67,346	139,617	2.07	1,230,026	184,022	3,753,307	20 40
Dundas	49,918	90,547	1.81	1,054,873	118,736	2,685,782	22 62
Durham	55,010	123,627	2.25	1,268,413	209,753	5,214,336	24 86
Elgin	78,890	163,188	2.07	1,827,706	218,873	5,298,746	24 21
Essex	70,060	121,898	1.74	1,300,652	261,431	6,432,903	24 61
Frontenac	81,525	159,948	1.96	1,589,883	147,375	2,946,163	19 93
Glengarry	61,340	122,954	2.00	1,212,326	124,710	2,510,851	20 13
Grenville	49,454	90,297	1.83	1,103,429	109,979	2,586,178	23 52
Grey	164,685	338,741	2.06	3,228,202	438,652	9,416,489	21 47
Haldimand	80,346	193,483	2.41	1,896,133	164,399	3,630,418	22 08
Haliburton	12,382	21,089	1.70	236,197	25,986	515,782	19 85
Halton	45,990	104,158	2.26	1,141,572	116,214	2,667,492	22 95
Hastings	97,816	213,539	2.18	2,152,473	267,179	6,130,207	22 94
Huron	145,516	263,762	1.81	2,648,170	413,183	9,477,050	20 52
Kent	84,416	170,712	2.02	1,790,769	328,067	9,437,477	28 77
Lambton	113,809	226,418	1.99	2,023,234	290,568	6,324,207	21 76
Lanark	77,539	163,230	2.11	1,744,929	162,118	3,801,999	23 45
Leeds	71,574	148,581	2.08	1,802,288	147,454	3,399,189	23 05
Lennox & Addington	69,814	163,886	2.35	1,881,411	144,682	3,570,092	24 68
Lincoln	54,163	126,352	2.33	1,477,055	102,975	2,597,067	25 22
Manitoulin	19,368	34,723	1.79	338,549	38,257	825,253	21 57
Middlesex	126,654	245,665	1.94	2,712,142	350,686	8,055,392	22 97
Muskoka	26,932	51,741	1.92	627,101	47,331	1,093,792	23 11
Nipissing	20,439	38,850	1.90	424,631	39,918	1,026,104	25 71
Norfolk	60,649	122,291	2.02	1,279,164	191,752	4,277,223	22 31
Northumberland	68,510	158,968	2.32	1,605,577	229,630	5,353,677	23 31
Ontario	69,910	165,627	2.37	1,798,709	278,425	7,216,159	25 92
Oxford	85,816	183,791	2.14	2,211,006	265,423	6,357,508	23 95
Parry Sound	29,610	55,112	1.86	608,988	59,490	1,414,870	23 78
Peel	61,762	140,857	2.28	1,577,598	175,683	4,137,769	23 55
Perth	100,099	210,390	2.10	2,385,329	311,859	7,510,605	24 08
Peterborough	50,648	106,274	2.10	1,099,936	164,654	3,986,140	24 21
Prescott	78,708	151,155	1.92	1,461,669	145,736	2,778,236	19 06
Prince Edward	46,452	108,438	2.33	1,045,342	124,208	2,678,622	21 59
Rainy River & Kenora	19,553	33,479	1.71	407,774	31,702	801,070	25 27
Renfrew	92,471	163,179	1.76	1,656,267	243,458	4,994,990	20 52
Russell	53,086	106,248	2.00	1,063,542	104,628	2,182,157	20 86
Simcoe	109,862	234,900	2.14	2,581,551	473,152	12,020,653	25 41
Stormont	44,952	88,173	1.96	973,430	96,758	2,151,347	22 23
Sudbury	23,689	40,253	1.70	430,305	41,490	982,045	23 67
Thunder Bay	11,972	24,437	2.04	345,295	24,523	849,977	34 66
Timiskaming	9,372	16,937	1.81	224,415	22,056	668,056	30 28
Victoria	50,959	113,828	2.23	1,223,651	190,850	4,359,111	22 84
Waterloo	56,083	124,016	2.21	1,541,519	199,793	5,075,578	25 40
Welland	58,742	121,773	2.07	1,344,374	123,628	2,745,167	22 21
Wellington	120,199	255,275	2.12	2,733,995	351,660	8,181,414	23 27
Wentworth	59,068	139,231	2.36	1,573,310	142,188	3,601,216	25 33
York	87,024	215,212	2.47	2,487,851	327,991	8,480,377	25 86
The Province:							
1916	3,471,984	7,200,047	2.07	76,326,501	9,548,876	223,748,948	23 43
1915	3,231,752	4,253,763	1.32	61,704,769	9,762,951	210,674,415	21 58
1914	3,415,484	3,842,554	1.13	55,917,380	9,621,444	199,152,945	20 70
Averages (10 years)							
1902-1911	3,072,288	4,722,662	1.54	47,093,908	9,233,879	156,824,689	16 98
1892-1901	2,520,783	3,650,840	1.45	29,085,813	8,494,796	106,139,762	12 49
1882-1891	2,290,495	3,102,733	1.35	32,086,445	7,517,606	116,195,708	15 48
Average (35 years)							
1882-1916	2,735,746	3,977,257	1.45	39,696,066	8,586,059	136,554,957	15 90

SUMMER FALLOW, PASTURE, ORCHARD, SMALL FRUITS, VINEYARD AND GARDEN.

TABLE XVI.—Showing by County Municipalities of Ontario the area of Summer Fallow, Pasture, Orchard, Small Fruits, Vineyard and Garden for the year 1916.

Counties and Districts.	Summer fallow.	Pasture.	Orchard.	Small Fruits.	Vineyard.	Garden.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Algoma	587	7,322	481	108	.....	420
Brant	5,811	28,333	4,162	419	9	810
Bruce	16,912	149,095	8,390	457	51	1,497
Carleton	5,203	105,036	2,086	173	3	1,318
Dufferin	5,696	56,092	2,444	79	24	528
Dundas	2,324	44,477	2,445	102	20	693
Durham	5,160	61,218	10,794	321	27	994
Elgin	6,454	95,992	9,115	728	39	1,740
Essex	5,057	53,231	7,190	1,398	362	2,619
Frontenac	2,225	84,333	2,280	200	10	1,214
Glengarry	1,053	47,618	1,458	76	7	552
Grenville	1,186	60,900	1,830	87	.....	651
Grey	13,698	168,360	12,059	332	93	1,645
Haldimand	12,782	36,047	5,143	413	68	938
Haliburton	273	14,108	221	21	3	286
Halton	5,428	29,842	7,593	1,503	162	710
Hastings	8,537	123,157	9,520	453	83	1,842
Huron	10,914	179,266	13,184	363	66	1,711
Kent	8,864	92,182	7,223	780	60	2,016
Lambton	12,507	148,979	13,127	734	75	1,849
Lanark	2,645	121,074	1,528	47	.....	720
Leeds	3,528	94,737	2,138	143	16	1,019
Lennox and Addington	8,549	73,745	4,458	409	41	1,159
Lincoln	6,470	21,197	15,211	2,526	4,767	1,284
Manitoulin	207	8,193	306	25	5	220
Middlesex	11,674	246,723	12,239	774	50	2,732
Muskoka	668	16,406	261	49	5	626
Nipissing	350	11,732	41	32	5	410
Norfolk	10,389	43,545	8,927	2,044	36	1,610
Northumberland	6,410	70,918	19,685	529	48	1,376
Ontario	6,716	68,696	7,081	490	63	1,399
Oxford	7,593	91,493	8,459	577	62	1,597
Parry Sound	983	19,511	178	34	6	530
Peel	7,943	56,382	5,408	624	60	844
Perth	12,269	102,557	6,296	302	44	1,283
Peterborough	6,640	65,336	2,819	179	2	1,118
Prescott	3,422	48,981	1,070	133	29	895
Prince Edward	4,318	43,504	10,133	605	20	800
Rainy River and Kenora	644	6,675	9	18	.....	321
Renfrew	3,150	89,441	1,212	133	25	1,420
Russell	232	34,309	661	83	7	590
Simcoe	32,562	116,169	9,650	514	41	2,768
Stormont	657	44,692	1,617	50	.....	487
Sudbury	1,610	8,571	17	32	.....	396
Thunder Bay	451	4,622	11	41	.....	391
Timiskaming	415	4,166	23	10	.....	302
Victoria	5,309	61,781	2,754	126	37	868
Waterloo	8,050	32,282	4,321	221	29	708
Welland	11,322	29,256	7,684	790	883	1,212
Wellington	11,930	92,788	6,028	294	50	1,152
Wentworth	8,102	32,360	10,877	1,592	2,282	1,239
York	15,857	62,151	8,806	644	32	1,598
The Province:						
1916	331,736	3,409,581	280,653	22,817	9,807	57,107
1915	226,217	3,350,420	288,825	23,443	10,276	57,774
1914	268,714	3,302,503	298,627	23,863	10,850	58,167
1913	268,487	3,120,146	306,764	24,360	11,136	55,029
1912	278,317	3,082,671	310,096	24,699	11,634	56,716
1911	279,220	3,116,768	303,188	25,360	11,586	58,748
1910	254,038	3,159,712	298,347	24,384	11,390	57,982
1909	231,707	3,180,780	300,364	24,614	11,420	57,123

RATIOS OF AREAS UNDER CROP.

TABLE XVII.--Showing by County Municipalities of Ontario the number of acres under the various crops in 1916 per 1,000 acres of cleared land; together with the comparative average for the Province for 1914 and 1915, and the annual averages for various periods.

Counties and Districts.	Fall Wheat.	Spring Wheat.	Barley.	Oats.	Peas.	Beans.	Rye.	Buck-wheat.	Corn.	Potatoes.	*Other roots.	Hay and Clover.	Mixed Grains.
Algoma	8.4	16.4	31.7	219.3	17.3	0.4	1.5	3.9	5.5	24.9	9.9	414.0	15.5
Brant	124.9	0.1	34.9	150.4	1.6	4.6	22.2	13.8	58.0	12.8	22.8	235.9	28.5
Bruce	54.3	5.8	39.3	195.5	9.8	0.4	3.0	7.9	23.8	7.1	10.5	235.7	40.4
Carleton	0.9	17.8	25.6	211.2	2.9	1.8	1.9	14.9	48.4	11.9	6.9	259.6	36.4
Dufferin	12.0	11.2	58.8	226.8	5.5	0.1	15.4	16.4	8.0	9.8	10.9	244.0	47.9
Dundas	2.4	7.1	27.7	168.7	1.8	1.7	3.9	30.3	67.8	9.1	2.1	278.8	61.9
Durham	32.7	24.0	35.8	182.7	19.7	2.2	42.3	20.7	39.8	9.3	17.2	177.8	73.6
Elgin	77.8	0.2	16.1	132.4	1.6	13.4	2.8	12.7	97.0	7.9	1.8	217.9	23.0
Essex	59.0	0.8	21.2	190.5	0.0	2.8	1.9	6.9	229.6	8.9	5.7	195.5	6.6
Frontenac	4.7	6.5	17.2	148.8	0.9	1.1	5.9	15.2	26.8	11.0	2.6	312.7	11.9
Glengarry	.....	18.7	17.6	199.8	2.0	1.0	....	13.5	34.7	11.0	3.9	313.6	21.8
Grenville	0.5	4.7	8.3	175.8	0.4	1.9	6.6	27.5	48.2	12.9	3.0	264.4	33.7
Grey	28.5	7.1	45.6	221.3	8.0	0.2	0.9	9.6	23.0	7.4	9.8	237.4	33.5
Haldimand	113.9	1.4	23.5	139.5	2.5	1.0	1.2	12.4	25.6	5.0	1.4	331.8	19.7
Haliburton	.....	5.8	17.6	213.3	4.9	....	8.7	14.0	7.4	13.3	6.8	270.1	4.9
Halton	86.8	5.5	42.8	168.6	4.6	0.9	1.7	7.7	30.0	6.7	12.6	266.7	39.4
Hastings	29.5	6.5	36.0	185.6	3.9	0.9	24.6	24.3	38.0	10.5	4.6	218.4	13.8
Huron	42.8	2.2	44.3	202.0	5.5	9.0	2.2	13.0	27.5	4.9	13.3	218.7	35.5
Kent	115.0	0.3	25.9	132.6	1.2	48.3	2.1	6.1	140.8	6.4	20.9	177.6	13.2
Lambton	65.5	0.5	27.8	144.5	1.0	2.2	0.6	2.4	74.2	5.1	5.3	224.7	19.8
Lanark	1.9	17.9	15.8	134.4	3.3	0.9	6.4	14.3	32.4	5.9	4.1	232.8	16.6
Leeds	5.2	6.4	12.9	154.7	1.5	1.2	6.8	17.3	37.4	8.8	4.9	263.4	22.3
Lennox & Addington	15.6	7.2	32.2	133.9	5.8	1.3	11.8	26.9	26.0	10.0	2.8	276.3	22.7
Lincoln	95.7	0.6	10.1	120.7	0.7	1.7	2.5	6.1	37.2	7.7	3.4	332.5	13.3
Manitoulin	8.0	45.4	50.2	164.3	28.4	0.8	6.6	3.3	18.5	12.7	10.9	403.3	44.2
Middlesex	63.9	0.3	23.5	148.6	1.0	2.1	2.0	2.4	59.6	9.5	5.3	191.1	19.8
Muskoka	0.5	3.5	10.2	217.4	9.6	0.3	4.7	4.5	11.0	17.9	9.8	291.3	6.9
Nipissing	0.2	17.8	16.3	223.8	18.3	0.3	2.0	4.0	3.8	19.4	8.7	358.3	26.8
Norfolk	110.1	....	16.0	135.4	4.5	6.3	38.3	37.1	83.0	11.4	5.1	215.2	18.0
Northumberland	45.3	17.7	26.7	173.6	8.0	2.7	47.1	43.8	41.4	11.3	14.4	196.2	29.3
Ontario	30.4	16.0	57.9	219.2	9.2	0.7	24.0	27.3	42.0	10.4	30.1	184.0	81.7
Oxford	67.8	0.3	25.6	177.4	0.6	0.5	3.8	13.0	87.7	6.0	17.7	214.5	48.5
Parry Sound	0.2	11.3	16.9	259.8	20.7	....	2.7	1.3	4.3	16.3	11.2	356.3	14.8
Peel	58.0	8.2	70.5	191.4	7.4	0.1	15.2	9.2	23.4	8.4	6.7	235.3	35.5
Perth	56.8	1.1	58.8	223.5	2.2	0.2	0.1	7.7	39.4	6.0	16.8	220.1	53.0
Peterborough	47.6	17.7	32.0	202.5	20.5	0.8	21.2	24.1	31.4	9.9	12.8	193.4	14.8
Prescott	0.4	15.3	25.1	211.1	3.1	1.8	1.0	7.9	37.8	10.7	2.7	379.3	6.2
Prince Edward	35.5	6.6	42.5	128.5	18.0	8.8	33.7	44.4	48.6	8.8	1.8	233.7	14.1
Rainy R'r & Kenora	0.8	44.6	33.7	172.6	2.3	0.0	3.5	0.2	1.5	20.8	5.7	472.3	7.7
Renfrew	6.2	90.0	16.2	184.7	28.4	1.1	27.0	7.0	23.5	10.3	3.5	253.1	15.3
Russell	1.4	16.4	22.3	201.5	5.7	2.4	0.5	9.8	42.0	9.1	4.8	346.4	20.5
Simcoe	95.3	9.2	79.6	208.2	10.9	0.8	23.2	26.4	24.7	13.7	14.0	161.8	29.0
Stormont	0.6	9.2	21.1	176.1	1.1	1.5	0.6	17.0	54.6	10.5	2.2	286.2	35.4
Sudbury	2.1	18.6	23.7	197.4	16.8	0.3	0.9	2.3	2.8	22.2	12.2	420.4	16.6
Thunder Bay	2.6	20.9	33.8	215.3	5.4	0.5	3.3	0.9	2.6	41.9	16.0	340.7	13.9
Timiskaming	1.6	43.4	31.7	251.3	36.0	1.2	....	0.5	0.1	24.8	11.8	310.3	17.6
Victoria	20.8	23.4	63.8	224.0	20.8	0.6	9.3	23.1	33.4	6.8	15.3	177.8	46.8
Waterloo	108.2	0.3	39.8	209.9	3.3	0.1	13.4	13.3	47.1	10.8	33.8	221.4	87.2
Welland	113.2	0.1	5.2	112.3	0.3	14.4	0.9	19.0	58.2	12.4	1.6	315.2	10.5
Wellington	21.2	5.7	50.5	216.2	7.2	0.3	3.0	18.4	20.1	10.0	24.9	239.2	83.0
Wentworth	94.7	0.7	27.3	152.2	1.5	0.9	2.6	10.8	37.3	15.0	15.3	278.0	32.9
York	68.5	17.4	68.0	226.3	8.4	1.0	13.5	27.8	36.0	13.4	18.0	198.8	51.9
The Province:													
1916	47.9	9.8	35.9	183.0	6.5	3.7	10.1	15.6	47.5	9.5	10.8	236.2	33.1
1915	55.5	11.1	37.8	196.4	8.7	4.3	11.9	13.2	51.5	11.9	11.9	221.0	32.5
1914	47.0	8.1	39.7	190.2	12.2	3.5	9.5	12.1	48.6	11.5	11.5	234.0	31.3
Average (10 yrs)													
1902-1911	51.3	13.0	50.7	192.8	27.7	3.6	8.0	9.4	40.1	10.9	15.8	219.0	†33.1
1892-1901	73.2	28.0	39.2	180.2	60.5	4.1	10.1	10.3	35.5	12.9	15.6	198.2	.....
1882-1891	81.6	50.9	67.2	150.4	60.5	2.4	9.4	6.2	17.7	14.0	12.2	207.1	.....
Average (35 years)													
1882-1916	64.6	25.9	49.8	177.9	42.3	3.5	9.2	9.6	34.6	12.2	15.1	212.3	‡34.5

*Including Sugar Beets. † Average for 5 years. ‡ Average for 10 years.

MARKET PRICES.

TABLE XVIII.—The following table shows by counties the average prices of agricultural products for 1916, together with the average price for 1914 and 1915, and the annual averages for various periods.

Counties and Districts.	Fall Wheat, per bush.	Spring Wheat, per bush.	Barley, per bush.	Oats, per bush.	Peas, per bush.	Beans, per bush.	Rye, per bush.	Buckwheat, per bush.	Corn (in ear) per bush.	Hay, per ton.	Potatoes, per bush.
	cts.	cts.	cts.	cts.	cts.	$ c.	cts.	cts.	cts.	$ c.	cts.
Algoma	164.3	167.1	90.0	70.7	192.6	4 80	105.0	96.7	84.5	11 31	129.1
Brant	160.8	163.3	102.2	65.6	195.8	5 17	118.0	111.7	72.3	10 63	147.9
Bruce	162.9	158.0	102.1	64.6	218.0	4 92	112.4	107.7	73.3	9 11	131.3
Carleton	167.2	167.7	103.5	71.5	217.6	5 30	102.5	107.5	88.6	10 42	125.5
Dufferin	160.0	159.6	104.2	60.3	205.4	4 00	124.6	110.0	79.5	8 81	125.3
Dundas	160.0	165.4	100.8	75.5	176.1	5 16	122.6	102.4	96.0	11 65	126.4
Durham	167.6	160.8	109.4	63.4	210.2	5 08	125.6	116.1	75.8	10 26	140.9
Elgin	155.1	152.5	94.0	70.9	230.0	5 38	110.7	106.1	76.8	11 20	141.6
Essex	152.0	157.0	91.0	66.1	266.0	5 59	103.1	104.3	71.5	10 67	140.3
Frontenac	165.5	167.7	104.3	69.7	185.6	5 40	124.3	112.2	84.2	9 94	152.5
Glengarry	.....	161.3	102.9	74.2	203.1	5 11	.....	100.0	77.0	9 86	115.4
Grenville	166.7	171.1	109.2	72.5	206.2	5 38	126.0	107.5	98.7	12 22	121.9
Grey	166.3	161.8	99.7	62.5	217.6	4 78	90.0	98.7	78.0	9 53	129.3
Haldimand	158.0	164.3	97.3	68.6	207.1	5 12	114.2	112.2	76.3	9 80	147.8
Haliburton	.....	162.7	103.5	68.2	195.6	.....	115.4	112.2	76.7	11 20	118.7
Halton	168.2	166.3	114.0	68.0	220.0	5 50	123.0	115.0	75.0	10 96	151.7
Hastings	160.3	164.9	103.3	68.9	191.0	5 17	115.0	106.7	88.6	10 08	143.2
Huron	163.5	165.0	97.5	64.4	209.3	5 69	118.3	105.0	83.3	10 04	135.2
Kent	156.4	150.0	92.2	65.7	220.0	5 46	108.9	98.8	72.9	10 49	139.8
Lambton	159.0	155.0	96.8	68.0	150.0	5 11	95.0	90.8	68.6	8 98	138.3
Lanark	160.3	163.5	97.9	69.0	197.3	4 83	109.7	96.5	85.1	10 69	128.4
Leeds	156.4	158.5	103.4	70.1	195.8	5 29	116.6	105.9	85.2	12 13	138.1
Lennox & Addington	161.0	164.3	102.2	69.9	204.0	5 72	120.7	115.6	85.6	11 48	144.6
Lincoln	162.3	164.2	95.9	66.6	173.5	5 21	109.4	119.0	80.7	11.69	146.3
Manitoulin	160.0	159.1	95.6	67.0	208.2	5 50	101.6	90.0	80.0	9 75	125.3
Middlesex	156.0	153.3	93.9	67.7	168.8	5 43	109.4	112.0	79.4	11 04	138.3
Muskoka	165.0	167.6	104.2	72.2	210.9	5 00	120.0	117.5	92.2	12 12	133.9
Nipissing	150.0	163.0	103.7	64.1	206.7	4 82	104.4	110.2	90.0	10 93	115.8
Norfolk	160.2	.....	98.3	66.6	214.2	5 27	122.6	121.3	70.4	10 46	132.4
Northumberland	167.7	162.7	106.9	65.6	204.3	5 33	124.2	115.5	78.7	10 10	147.4
Ontario	166.0	163.3	107.6	61.6	207.4	5 39	122.5	115.6	74.6	10 86	132.2
Oxford	156.7	156.7	96.7	66.2	198.5	5 10	117.2	107.8	71.1	12 03	137.0
Parry Sound	163.0	160.3	107.4	71.1	202.0	5 00	118.8	103.3	89.3	10 05	124.4
Peel	168.1	163.0	108.6	64.3	211.8	5 50	116.8	112.3	88.7	11 20	131.8
Perth	163.3	163.7	99.5	66.0	192.8	4 86	90.0	100.0	69.7	11 10	142.4
Peterborough	167.8	166.3	103.3	61.4	217.7	5 31	119.8	115.8	90.2	10 35	140.3
Prescott	162.5	175.5	102.4	73.5	258.8	5 33	110.0	122.0	91.0	9 67	126.8
Prince Edward	152.9	147.3	103.6	68.4	182.7	5 88	119.1	117.1	83.5	9 64	142.9
Rainy R. & Kenora	158.8	161.8	87.9	67.6	213.8	5 00	115.0	100.0	75.0	12 18	96.7
Renfrew	164.4	162.5	90.2	63.8	218.7	4 64	111.5	88.5	100.0	10 15	113.0
Russell	160.0	164.6	101.8	69.1	238.2	5 10	99.0	106.3	95.2	10 01	121.2
Simcoe	163.4	159.8	102.9	62.0	216.4	5 11	120.2	105.7	76.7	10 99	126.5
Stormont	156.0	155.0	93.9	67.7	166.3	5 43	109.4	112.0	83.4	11 04	138.3
Sudbury	163.3	157.8	107.4	71.0	223.6	4 40	110.0	118.4	90.0	10 69	123.3
Thunder Bay	160.0	170.0	91.6	64.6	206.0	5 00	100.0	100.0	75.0	14 13	97.8
Timiskaming	154.4	151.5	95.2	69.2	201.9	4 50	.....	100.0	.....	13 25	109.7
Victoria	164.1	155.3	105.6	61.1	217.4	5 44	114.4	110.4	86.7	10 75	141.9
Waterloo	159.7	158.3	98.9	64.6	183.2	4 50	109.2	103.4	74.7	12 43	142.9
Welland	163.2	160.0	97.0	64.0	156.2	6 06	111.2	115.9	78.5	11 04	149.3
Wellington	163.5	158.9	104.1	69.0	212.3	5 38	114.5	106.7	76.7	10 71	138.9
Wentworth	163.5	156.0	103.0	65.9	176.7	5 71	110.6	106.8	74.3	11 30	143.7
York	166.7	163.2	106.8	65.7	210.5	5 45	118.1	111.4	74.9	11 56	138.9
The Province:											
1916	161.3	162.2	101.9	66.0	210.5	5 46	118.8	109.0	74.3	10 60	130.1
1915	97.1	98.6	56.0	39.5	161.6	3 11	78.9	71.5	45.4	14 51	81.4
1914	109.1	107.9	64.3	49.5	136.6	2 14	84.9	71.5	45.7	14 55	44.0
Averages (10 years)											
1902-1911	83.6	81.2	50.1	36.7	74.8	1 48	60.2	52.4	38.2	9 97	51.4
1892-1901	67.8	67.5	38.5	27.9	53.5	93	44.9	38.7	25.0	7 97	33.6
1882-1891	90.0	89.6	54.5	34.3	61.6	1 16	60.0	41.5	.....	10.34	45.0
Average (35 years)											
1882-1916	83.9	83.0	51.1	35.5	63.4	1 43	59.6	51.4	*34.7	9 08	46.4

* Average for 25 years, 1892-1916.

HORSES AND

TABLE XIX.—Showing by County Municipalities the number and value of Horses and Cattle June 30th, 1916, together with the totals

Counties and Districts.	Horses all ages.		Horses sold.		Cattle. Milch cows on Hand.	
	Number on hand.	Value.	Number.	Value.	Number.	Value.
		$		$		$
Algoma	3,093	445,392	270	35,640	4,131	268,763
Brant	10,053	1,337,049	710	98,690	13,877	1,049,379
Bruce	29,203	3,650,375	3,862	529,094	29,516	2,012,991
Carleton	18,369	2,626,767	1,661	245,828	34,208	2,150,999
Dufferin	13,217	1,652,125	1,705	223,355	13,803	921,764
Dundas	9,745	1,218,125	770	97,790	25,944	1,605,415
Durham	16,195	2,105,350	1,520	214,320	16,266	1,043,789
Elgin	19,700	2,620,100	2,161	302,540	28,021	2,067,670
Essex	25,061	3,408,296	2,384	338,528	18,925	1,246,022
Frontenac	11,068	1,317,092	878	103,604	24,136	1,452,022
Glengarry	10,035	1,274,445	942	129,054	22,934	1,446,218
Grenville	7,821	1,001,088	696	88,392	18,311	1,142,606
Grey	33,360	4,262,400	3,632	468,528	36,112	2,439,727
Haldimand	13,619	1,797,708	1,349	192,907	14,921	1,042,829
Haliburton	1,834	238,420	154	19,250	2,887	164,963
Halton	9,095	1,200,540	672	86,688	11,140	831,044
Hastings	19,168	2,491,840	1,641	211,689	37,328	2,138,894
Huron	35,056	4,627,392	5,075	735,875	34,815	2,447,146
Kent	29,356	3,816,280	2,651	357,885	22,896	1,568,834
Lambton	26,868	3,385,368	3,170	443,800	29,448	2,110,244
Lanark	11,978	1,605,052	1,272	169,176	22,960	1,376,682
Leeds	11,231	1,415,106	654	77,826	32,360	1,953,573
Lennox & Addington	11,445	1,316,175	740	93,240	20,176	1,168,594
Lincoln	10,007	1,320,924	714	89,250	9,172	668,180
Manitoulin	2,868	344,160	351	47,385	3,969	260,128
Middlesex	36,763	4,815,953	4,858	699,552	46,641	3,373,544
Muskoka	3,463	505,598	286	37,466	5,418	330,823
Nipissing	2,391	365,823	272	36,176	4,461	256,998
Norfolk	16,452	2,122,308	1,359	173,952	19,117	1,332,264
Northumberland	19,043	2,323,246	1,716	207,636	24,367	1,625,279
Ontario	23,005	3,082,670	2,434	348,062	24,176	1,767,266
Oxford	23,084	3,070,172	2,106	294,840	47,393	3,289,074
Parry Sound	4,051	571,191	322	39,284	5,766	357,261
Peel	14,111	1,904,985	1,627	237,542	17,818	1,223,740
Perth	27,098	3,576,936	3,230	465,120	35,639	2,636,930
Peterborough	13,392	1,674,000	1,255	159,385	19,088	1,126,192
Prescott	8,729	1,169,686	809	109,215	21,112	1,232,941
Prince Edward	9,912	1,159,704	680	89,080	14,011	828,751
Rainy River & Kenora	2,327	393,263	212	35,404	2,234	156,670
Renfrew	16,054	2,327,830	1,409	185,988	24,955	1,310,637
Russell	7,859	1,021,670	841	111,853	17,025	992,441
Simcoe	37,865	5,036,045	3,480	476,760	37,973	2,455,714
Stormont	8,130	1,016,250	704	92,928	22,616	1,349,044
Sudbury	2,241	345,114	249	34,362	3,801	218,063
Thunder Bay	1,822	302,452	87	10,440	2,576	202,551
Timiskaming	1,529	256,872	153	21,879	1,529	115,103
Victoria	14,885	1,905,280	1,394	193,766	17,069	1,092,416
Waterloo	14,272	1,784,000	1,763	223,901	17,660	1,279,997
Welland	10,388	1,360,828	682	91,388	11,663	807,429
Wellington	27,221	3,429,846	2,868	392,916	27,735	2,123,114
Wentworth	13,315	1,797,525	1,020	123,420	14,672	1,055,504
York	26,945	3,637,575	2,669	392,343	30,260	2,219,571
The Province:						
1916	775,732	101,434,391	78,119	10,684,992	1,045,029	69,337,793
1915	779,131	107,982,037	75,527	11,003,822	1,022,518	62,196,964
1914	774,544	112,576,793	80,872	12,480,960	1,006,703	57,396,788
1913	751,726	113,240,047	96,841	15,507,939	1,002,039	52,176,881
1912	742,139	109,000,214	101,911	15,793,129	1,044,177	49,929,061

CATTLE.

on hand July 1, 1916, and the number and value of those sold or slaughtered in the year ending for the Province for the past five years.

Cattle.						Counties and Districts.
Other cattle on hand.		Total on hand.		Sold or slaughtered.		
Number.	Value.	Number.	Value	Number.	Value.	
	$		$		$	
6,532	186,685	10,663	455,448	2,934	125,399	Algoma.
18,835	697,837	32,712	1,747,216	10,683	613,204	Brant.
75,516	2,837,891	105,032	4,850,882	36,324	2,406,465	Bruce.
47,135	1,713,357	81,343	3,864,356	24,520	1,156,118	Carleton.
33,123	1,284,510	46,926	2,206,274	14,357	881,663	Dufferin.
18,721	498,540	44,665	2,103,955	8,961	367,043	Dundas.
33,600	1,180,704	49,866	2,224,493	16,065	896,748	Durham.
42,710	1,785,278	70,731	3,852,948	28,210	1,670,032	Elgin.
26,519	865,315	45,444	2,111,337	15,273	706,376	Essex.
23,122	676,319	47,258	2,128,341	13,896	588,774	Frontenac.
18,110	510,340	41,044	1,956,558	9,130	352,327	Glengarry.
17,883	506,804	36,194	1,649,410	9,024	342,822	Grenville.
83,467	3,211,810	119,579	5,651,537	39,863	2,407,725	Grey.
23,983	852,835	38,904	1,895,664	14,449	737,332	Haldimand.
5,453	150,176	8,340	315,139	2,091	78,162	Haliburton.
20,984	847,544	32,124	1,678,588	10,513	630,570	Halton.
46,173	1,093,377	83,501	3,232,271	24,161	807,944	Hastings.
89,282	3,651,634	124,097	6,098,780	42,293	2,733,820	Huron.
53,812	2,175,081	76,708	3,743,915	28,101	1,675,944	Kent.
71,865	2,970,899	101,313	5,081,143	35,356	2,173,687	Lambton.
44,032	1,278,689	66,992	2,655,371	19,292	865,053	Lanark.
28,250	754,275	60,610	2,707,848	14,460	596,186	Leeds.
26,935	712,700	47,111	1,881,294	13,265	496,376	Lennox & Addington.
11,110	382,851	20,282	1,051,031	6,816	323,964	Lincoln.
8,903	247,236	12,872	507,364	3,882	202,252	Manitoulin.
95,440	3,901,315	142,051	7,274,859	54,316	3,136,749	Middlesex.
8,806	237,762	14,224	568,585	4,639	179,019	Muskoka.
7,339	181,127	11,800	438,125	3,406	127,453	Nipissing.
23,762	692,662	42,879	2,024,926	14,488	588,358	Norfolk.
35,682	1,060,469	60,049	2,685,748	19,176	835,690	Northumberland.
51,968	1,937,367	76,144	3,704,633	23,787	1,471,226	Ontario.
44,179	1,679,686	91,572	4,968,760	27,694	1,512,092	Oxford.
12,394	361,657	18,160	718,918	5,228	217,328	Parry Sound.
28,901	1,193,900	46,719	2,417,640	16,737	1,017,610	Peel.
65,619	2,427,903	101,258	5,064,833	32,054	1,902,084	Perth.
31,881	906,696	50,969	2,032,888	14,112	641,390	Peterborough.
18,945	445,776	40,057	1,678,717	8,663	294,455	Prescott.
14,381	400,079	28,392	1,228,830	8,343	306,021	Prince Edward.
4,112	122,209	6,346	278,879	1,973	85,747	Rainy River & Kenora.
48,757	1,283,772	73,712	2,594,409	21,549	938,459	Renfrew.
16,907	467,648	33,930	1,460,089	9,070	344,660	Russell.
78,725	2,583,755	116,698	5,039,469	36,871	2,083,212	Simcoe.
15,077	413,110	37,693	1,762,154	7,326	267,326	Stormont.
5,793	147,432	9,594	365,495	3,270	122,756	Sudbury.
3,837	101,182	6,413	303,733	1,950	67,899	Thunder Bay.
1,937	54,100	3,466	169,203	1,344	59,485	Timiskaming.
37,901	1,260,587	54,970	2,353,003	17,287	885,786	Victoria.
28,619	1,060,048	46,279	2,340,045	21,995	1,368,309	Waterloo.
15,275	501,631	26,938	1,309,060	8,900	424,174	Welland.
61,688	2,292,326	89,423	4,415,440	34,482	2,217,882	Wellington.
20,486	766,586	35,158	1,822,090	12,773	651,678	Wentworth.
35,302	1,433,261	65,562	3,652,832	23,188	1,404,729	York.
						The Province:
1,689,738	58,986,733	2,734,767	128,324,526	878,540	46,987,563	1916.
1,652,228	53,166,372	2,674,746	115,363,336	875,394	43,678,233	1915.
1,597,925	49,238,360	2,604,628	106,635,148	911,794	42,978,531	1914.
1,596,806	43,582,141	2,628,845	95,759,022	880,303	38,751,801	1913.
1,580,603	40,474,841	2,624,780	90,403,902	849,140	36,269,271	1912.

SHEEP, SWINE

TABLE XX.—Showing by County Municipalities the number and value of Sheep, Swine and year ending June 30, 1916, together with the

Counties and Districts.	Sheep and Lambs.				Swine.	
	Number on hand.	Value.	Sold or slaughtered.		Number on hand.	Value.
			Number.	Value.		
		$		$		$
Algoma	8,145	55,386	3,425	20,961	4,041	41,420
Brant	11,084	93,881	6,114	47,811	23,906	265,357
Bruce	38,597	333,092	21,331	156,996	55,155	616,081
Carleton	27,832	210,410	14,309	105,887	27,433	299,294
Dufferin	25,901	214,201	12,380	94,088	32,906	348,475
Dundas	5,227	38,209	2,917	20,390	25,568	283,038
Durham	23,646	205,247	11,750	98,935	31,228	325,396
Elgin	20,094	169,593	12,182	99,161	57,377	620,819
Essex	19,441	148,140	9,579	64,658	126,385	1,252,475
Frontenac	16,302	123,895	9,957	67,309	17,616	197,828
Glengarry	5,822	40,754	3,382	21,510	14,844	175,159
Grenville	9,400	70,688	6,749	45,421	15,924	181,534
Grey	61,498	525,652	34,289	265,597	60,905	643,766
Haldimand	16,994	142,750	9,179	71,596	25,042	269,953
Haliburton	6,035	40,797	2,590	14,608	2,400	25,440
Halton	9,788	87,603	5,160	44,273	19,138	212,623
Hastings	29,529	209,656	15,067	92,662	43,397	492,122
Huron	26,598	231,403	13,712	111,341	73,433	743,142
Kent	22,584	190,609	11,888	93,440	120,662	1,215,066
Lambton	27,018	229,113	15,239	126,484	67,288	728,056
Lanark	34,248	266,107	17,298	126,275	20,585	208,938
Leeds	14,798	107,877	7,167	50,169	26,401	272,194
Lennox and Addington	13,073	83,667	6,730	42,063	19,931	222,231
Lincoln	6,158	59,425	3,753	28,072	14,110	171,013
Manitoulin	20,240	138,846	8,740	52,964	4,329	47,576
Middlesex	23,119	214,544	13,477	113,881	64,166	709,676
Muskoka	10,448	72,614	5,382	34,337	3,016	35,951
Nipissing	6,493	44,282	3,470	20,161	4,734	47,861
Norfolk	13,820	109,316	7,535	56,513	34,864	370,256
Northumberland	15,201	129,513	7,350	55,199	33,162	374,731
Ontario	31,396	299,832	15,330	127,239	54,781	627,242
Oxford	9,149	83,256	4,774	40,722	57,137	655,933
Parry Sound	16,154	117,117	7,765	48,920	5,739	56,931
Peel	13,531	123,809	6,458	52,956	26,647	284,856
Perth	13,675	127,178	7,565	64,832	73,669	836,143
Peterborough	15,520	114,072	6,896	46,893	20,384	232,378
Prescott	5,166	36,162	4,372	28,811	15,252	183,024
Prince Edward	8,794	69,824	4,892	32,776	15,191	168,012
Rainy River and Kenora	1,848	14,710	908	6,719	2,911	31,643
Renfrew	52,360	329,868	23,971	158,209	24,028	261,905
Russell	3,276	24,177	1,907	13,463	15,313	166,299
Simcoe	53,809	440,158	27,874	219,926	83,842	845,127
Stormont	3,770	29,632	2,571	17,740	18,905	194,154
Sudbury	4,491	31,347	2,019	12,538	4,116	46,717
Thunder Bay	1,237	9,760	481	3,045	3,339	35,994
Timiskaming	1,024	7,782	311	2,224	1,505	20,603
Victoria	23,090	184,720	11,221	84,606	32,004	348,204
Waterloo	6,063	54,506	3,136	27,189	44,789	478,347
Welland	7,094	52,354	4,150	26,145	12,912	150,554
Wellington	37,151	367,795	18,963	174,270	70,397	851,100
Wentworth	11,354	101,732	6,521	54,972	24,195	285,501
York	19,071	179,649	11,220	101,765	58,252	632,617
The Province:						
1916	908,066	7,386,710	475,406	3,588,522	1,735,254	18,790,755
1915	908,095	6,403,907	489,320	3,289,701	1,769,295	17,562,726
1914	922,375	6,155,451	512,066	3,219,409	1,770,533	17,951,258
1913	996,155	6,242,672	534,311	3,163,752	1,618,734	15,393,192
1912	1,021,848	6,181,595	531,957	3,054,930	1,702,652	14,141,908

AND POULTRY.

Poultry on hand on July 1, 1916, and the number and value of those sold or slaughtered in the totals for the Province for the past five years.

Swine.		Poultry of all classes.				Counties and Districts.
Sold or slaughtered.		Number on hand.	Value.	Sold or slaughtered.		
Number.	Value.			Number.	Value.	
	$		$		$	
5,252	65,965	63,635	37,764	33,352	21,679	Algoma.
32,850	529,542	158,564	86,073	78,802	51,221	Brant.
77,832	1,249,982	506,661	260,101	224,153	134,492	Bruce.
35,017	551,518	349,796	218,158	194,529	136,170	Carleton.
34,676	579,783	196,463	106,801	88,704	55,884	Dufferin.
28,696	426,136	243,870	137,674	104,475	67,909	Dundas.
40,564	678,230	285,838	156,572	125,116	77,572	Durham.
74,033	1,180,086	433,247	233,646	204,463	122,678	Elgin.
118,754	1,884,626	691,809	359,822	299,080	167,485	Essex.
21,590	333,134	185,172	116,874	113,588	72,696	Frontenac.
16,392	276,533	180,335	104,204	90,559	56,147	Glengarry.
18,067	282,207	175,397	100,212	89,018	55,191	Grenville.
80,294	1,289,522	538,627	273,366	243,901	146,341	Grey.
33,394	525,622	252,252	138,791	128,320	78,275	Haldimand.
2,732	41,554	28,864	14,961	12,676	7,606	Haliburton.
26,090	419,527	160,237	103,089	93,389	65,372	Halton.
52,950	828,668	353,859	187,410	162,292	97,375	Hastings.
100,272	1,614,379	687,139	356,834	278,076	166,846	Huron.
116,384	1,870,291	679,991	329,354	288,784	158,831	Kent.
78,937	1,302,461	594,804	298,306	263,137	157,882	Lambton.
26,320	401,906	207,807	113,970	93,476	59,825	Lanark.
28,734	444,515	203,341	111,019	98,157	58,894	Leeds.
24,780	395,737	206,141	117,297	98,910	60,335	Lennox & Addington.
20,594	333,829	177,052	102,075	109,290	72,131	Lincoln.
5,598	80,779	43,828	23,783	23,841	14,543	Manitoulin.
80,704	1,288,843	775,893	440,232	341,998	212,039	Middlesex.
5,695	77,053	67,763	36,242	36,845	21,002	Muskoka.
4,452	68,561	45,192	24,156	22,774	14,120	Nipissing.
45,904	714,725	329,655	174,447	155,514	87,088	Norfolk.
46,622	714,249	342,628	195,782	148,592	89,155	Northumberland.
62,942	1,029,102	367,242	233,058	183,313	128,319	Ontario.
75,087	1,211,904	404,770	219,813	169,322	103,286	Oxford.
8,144	108,560	66,315	36,551	32,641	20,237	Parry Sound.
35,464	570,616	242,442	158,805	152,775	109,998	Peel.
92,944	1,548,447	497,435	257,339	206,738	124,043	Perth.
28,513	441,952	232,925	132,323	109,586	67,943	Peterborough.
12,067	220,464	160,597	95,706	86,300	54,369	Prescott.
19,846	301,262	158,584	87,859	75,850	46,269	Prince Edward.
3,639	52,875	47,109	25,889	21,059	13,478	Rainy River and Kenora.
21,634	344,197	237,670	132,719	113,050	70,091	Renfrew.
14,181	223,351	128,283	71,184	76,578	48,244	Russell.
98,237	1,620,911	602,935	320,486	269,660	169,886	Simcoe.
22,577	363,264	175,631	99,971	75,982	47,109	Stormont.
3,785	62,301	44,483	25,388	26,892	16,942	Sudbury,
3,297	45,334	47,169	28,339	19,789	12,665	Thunder Bay.
1,903	31,323	31,858	17,843	14,490	9,274	Timiskaming.
36,448	621,438	246,891	137,432	102,749	63,704	Victoria.
55,198	858,329	240,136	121,859	99,137	58,491	Waterloo.
18,500	277,870	222,287	129,880	128,645	78,473	Welland.
96,772	1,558,029	404,832	228,023	194,977	132,584	Wellington.
33,410	546,922	203,165	126,603	111,021	77,715	Wentworth.
76,854	1,183,552	449,225	287,072	258,519	186,134	York.
						The Province:
2,105,621	33,671,966	14,377,844	7,933,157	6,774,884	4,226,038	1916.
2,110,936	31,628,772	14,273,091	7,670,326	6,764,069	4,161,695	1915.
1,984,105	30,275,538	14,175,214	7,551,428	6,575,434	4,062,797	1914.
2,078,462	28,378,551	13,511,383	6,956,952	6,325,007	3,848,973	1913.
2,088,874	26,656,149	13,024,983	6,121,323	5,501,913	3,208,860	1912.

WOOL CLIP, POULTRY ON HAND AND LIVE STOCK SOLD.

TABLE XXI. Showing by County Municipalities the number of pounds of wool, the number of turkeys, geese, ducks and other fowls on hand June 30th, 1916; also the value of all live stock sold or killed in the year ending June 30, 1916, together with the totals for the Province for the past five years.

Counties and Districts.	Wool Clip.	Poultry on Hand.				Total value of Live Stock sold or killed.
		Turkeys.	Geese.	Ducks.	Other fowl.	
	lbs.	No.	No.	No.	No.	$
Algoma	33,943	3,857	893	556	58,329	269,644
Brant	41,758	609	4,042	4,959	148,954	1,340,468
Bruce	139,121	27,515	16,959	26,833	435,354	4,477,029
Carleton	94,470	16,630	14,064	13,314	305,788	2,195,521
Dufferin	92,294	4,500	15,021	8,178	168,764	1,834,773
Dundas	19,506	16,750	5,878	7,582	213,660	979,268
Durham	94,635	9,170	10,858	12,688	253,122	1,965,805
Elgin	74,655	20,365	8,202	13,217	391,463	3,374,497
Essex	73,260	14,647	15,363	32,977	628,822	3,161,673
Frontenac	57,164	20,948	4,337	6,491	153,396	1,165,517
Glengarry	18,310	14,570	3,936	4,154	157,675	835,571
Grenville	30,776	9,870	5,015	5,807	154,705	814,033
Grey	207,203	19,717	21,293	25,024	472,593	4,577,513
Haldimand	62,202	7,903	7,193	11,021	226,135	1,605,732
Haliburton	18,759	1,901	365	878	25,720	161,180
Halton	42,447	3,868	6,055	7,458	142,856	1,246,430
Hastings	86,715	17,576	8,489	8,883	318,911	2,038,338
Huron	97,830	21,959	21,196	40,610	603,374	5,362,261
Kent	109,289	13,688	13,763	38,652	613,888	4,156,391
Lambton	114,359	33,103	15,629	26,610	519,462	4,204,314
Lanark	100,482	13,059	4,113	5,050	185,585	1,622,235
Leeds	44,417	10,930	3,121	6,834	182,456	1,227,590
Lennox & Addington	42,898	14,773	3,454	6,090	181,824	1,087,751
Lincoln	24,520	3,439	2,538	7,147	163,928	847,246
Manitoulin	75,512	2,997	1,206	1,589	38,036	397,923
Middlesex	110,282	39,926	15,902	36,497	683,568	5,451,064
Muskoka	34,309	1,627	324	1,207	64,605	348,877
Nipissing	23,066	1,252	778	1,030	42,132	266,471
Norfolk	51,524	10,437	6,159	13,747	299,312	1,620,636
Northumberland	65,828	16,974	7,050	7,151	311,453	1,901,929
Ontario	148,655	6,336	15,628	17,064	328,214	3,103,948
Oxford	40,707	5,702	7,898	15,447	375,722	3,162,844
Parry Sound	61,567	4,126	1,716	1,177	59,296	434,329
Peel	50,842	10,482	10,263	15,604	206,093	1,988,722
Perth	53,349	9,633	17,494	28,386	441,922	4,104,526
Peterborough	55,652	17,008	7,184	6,785	201,948	1,357,563
Prescott	18,876	12,572	5,085	3,432	139,508	707,314
Prince Edward	26,617	8,762	2,455	4,325	143,042	775,408
Rainy River & Kenora	7,145	1,940	702	1,364	43,103	194,223
Renfrew	144,509	7,905	7,547	5,565	216,653	1,696,944
Russell	11,856	4,561	4,814	5,558	113,350	741,571
Simcoe	219,614	24,129	23,738	22,690	532,378	4,570,695
Stormont	13,068	14,203	2,640	4,037	154,751	788,367
Sudbury	16,521	1,833	681	843	41,126	248,899
Thunder Bay	4,777	2,164	538	912	43,555	139,383
Timiskaming	4,214	434	248	472	30,704	124,185
Victoria	88,480	10,852	10,214	8,332	217,493	1,849,300
Waterloo	23,672	1,203	5,298	6,698	226,937	2,536,219
Welland	23,140	3,863	2,325	10,072	206,027	898,050
Wellington	150,680	5,070	18,927	15,358	365,477	4,475,681
Wentworth	38,255	1,756	4,971	8,634	187,810	1,454,707
York	96,521	8,840	14,484	21,716	404,185	3,268,523
The Province:						
1916	3,380,251	557,929	408,046	586,705	12,825,164	99,159,081
1915	3,333,768	674,494	416,414	545,813	12,636,370	93,762,233
1914	3,370,225	744,096	425,300	586,654	12,419,164	93,017,235
1913	3,647,245	699,861	389,173	497,734	11,924,615	89,651,116
1912	3,669,419	660,843	362,674	415,251	11,586,215	84,982,339

FARM PROPERTY, IMPLEMENTS AND LIVE STOCK.

TABLE XXII.—Showing by County Municipalities of Ontario the value of farm lands, buildings, implements and live stock for the year 1916, together with the totals for the Province for the past five years.

Counties and Districts.	Land.	Buildings.	Implements.	Live Stock on hand.	Total.
	$	$	$	$	$
Algoma	3,626,800	1,213,434	450,170	1,035,410	6,325,814
Brant	11,183,700	5,862,969	1,447,317	3,529,576	22,023,562
Bruce	27,058,454	12,265,799	3,206,797	9,710,531	52,241,581
Carleton	22,569,614	8,445,302	2,634,203	7,218,985	40,868,104
Dufferin	11,380,659	5,529,699	1,389,215	4,527,876	22,827,449
Dundas	10,029,516	5,003,123	1,592,589	3,781,001	20,406,229
Durham	13,156,455	6,910,971	1,695,399	5,017,058	26,779,883
Elgin	21,206,936	10,210,188	2,855,667	7,497,106	41,769,897
Essex	32,398,580	11,508,865	3,516,119	7,280,070	54,703,634
Frontenac	11,266,751	4,755,384	1,424,274	3,884,030	21,330,439
Glengarry	10,575,479	4,949,789	1,417,466	3,551,120	20,493,854
Grenville	7,164,344	3,710,036	1,116,291	3,002,932	14,993,603
Grey	26,668,905	13,959,839	3,713,196	11,356,721	55,698 661
Haldimand	10,897,376	5,975,911	1,765,643	4,244,866	22,883,796
Haliburton	1,542,798	518,030	220,830	634,757	2,916,415
Halton	12,775,134	5,229,599	1,324,700	3,282,443	22,611,876
Hastings	18,544,461	8,171,865	2,480,540	6,613,299	35,810,165
Huron	29,602,727	15,369,226	3,733,280	12,057,551	60,762,784
Kent	36,799,454	13,542,975	3,963,087	9,295,224	63,600,740
Lambton	27,663,108	11.510,437	3,320,898	9,721,986	52,216.429
Lanark	12,132,492	4,809,684	1,508,584	4,849,438	23,300,198
Leeds	11,347,733	5,572,982	1,653,178	4,614,044	23,187,937
Lennox & Addington	10.300,372	4,969,842	1,495,353	3,620,664	20,386,231
Lincoln	19,232,771	7,059,317	1,660,951	2,704,468	30,657,507
Manitoulin	1,873,166	750,941	265,857	1,061,729	3,951,693
Middlesex	38,140,526	17,389,304	4,512,465	13,455,264	73,497,559
Muskoka	3,134,082	1,452,324	518,434	1,218,990	6,323,830
Nipissing	2,996,379	961,919	492,277	920,247	5,370,822
Norfolk	15,164,784	7,500,694	2,098,815	4,801,253	29,565,546
Northumberland	15,327,422	8,037,206	2,071,017	5,709,020	31,144,665
Ontario	20,434,772	9,754,722	2,367,425	7,947,435	40,504,354
Oxford	24,546,920	12,113,955	3,222,097	8,997,934	48,880,906
Parry Sound	3,128,091	1,399,402	549,197	1,500,708	6,577,398
Peel	15,340,794	7,411,902	1,600,611	4,890,095	29,243,402
Perth	23,747,328	12,762,888	3,165,764	9,862,429	49,538,409
Peterborough	12,753,262	5,519,058	1,391,134	4,185,661	23,849,115
Prescott	12,671.485	5,189,398	1,538,121	3,163,295	22,562,299
Prince Edward	8,115,002	4,487,567	1,389,361	2,714,229	16,706,159
Rainy River & Kenora	2,998,940	728,866	329,316	744,384	4,801,506
Renfrew	15,835,628	5,997,834	2,068,832	5,646,731	29,549,025
Russell	10,360,072	3,921,937	1,300,074	2,743,419	18,325,502
Simcoe	31,956,842	15,347,436	4,210,408	11,681,285	63,195,971
Stormont	8,139,321	4,107,928	1,178,296	3,102,161	16,527,706
Sudbury	3,447,464	921,574	458,788	814,061	5,641,887
Thunder Bay	4,331,081	737,931	315.854	680,278	6,065,144
Timiskaming	2,865,706	559,201	316,961	472,303	4,214,171
Victoria	14,751,822	5,596,727	1,596,559	4,928,639	26,873,747
Waterloo	14,560,323	7,654,296	1,888,909	4,778,757	28,882,285
Welland	12,094,499	5,644,786	1,622,965	3,002,676	22,364,926
Wellington	23,127,425	12,571,713	2,964,091	9,292,204	47,955,433
Wentworth	18,447,052	7,736,349	1,961,821	4,133,451	32,278,673
York	35,262,059	14,000,726	3,039,099	8,389,745	60,691,629
The Province:					
1916	794,676,866	357,313,850	98,020,295	263,869,539	1,513,880,550
1915	794,393,564	352,628,031	95,049,350	254,982,332	1,497,053,277
1914	790,538,706	347,348,643	91,703,876	250,870,078	1,480,461,303
1913	782,993,853	345,303,335	89,702,273	237,591,885	1,455,591,346
1912	758,729,268	335,141,520	86.231,210	225,848,942	1,405,950,940

FARM VALUES PER ACRE.

TABLE XXIII.—Showing by County Municipalities of Ontario average values per acre of farm property in 1916, together with the average for the Province for 1915 and preceding years at ten-year intervals, from 1882–1912.

Counties and Districts.	Farm values, average per acre occupied.					Values, buildings, Implements, and live stock, per acre, cleared
	Land.	Buildings.	Implements.	Live Stock.	Total.	
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Algoma	11 89	3 98	1 47	3 39	20 73	53 82
Brant	51 85	27 18	6 79	16 36	102 10	60 22
Bruce	29 21	13 24	3 46	10 48	56 39	42 91
Carleton	40 25	15 06	4 70	12 87	72 88	49 35
Dufferin	32 06	15 58	3 91	12 76	64 31	41 48
Dundas	42 30	21 10	6 72	15 94	86 06	57 97
Durham	35 41	18 61	4 56	13 50	72 08	44 03
Elgin	48 66	23 43	6 55	17 20	95 84	56 80
Essex	76 18	27 06	8 27	17 12	128 63	62 24
Frontenac	16 11	6 80	2 04	5 55	30 50	38 61
Glengarry	36 78	17 22	4 93	12 35	71 28	50 71
Grenville	26 28	13 61	4 10	11 01	55 00	41 85
Grey	25 13	13 15	3 50	10 70	52 48	41 85
Haldimand	38 71	21 23	6 27	15 08	81 29	49 51
Haliburton	2 60	87	37	1 07	4 91	29 96
Halton	56 85	23 27	5 89	14 61	100 62	57 05
Hastings	17 21	7 58	2 30	6 14	33 23	38 56
Huron	37 05	19 24	4 67	15 09	76 05	46 82
Kent	64 76	23 83	6 97	16 35	111 93	56 40
Lambton	41 95	17 46	5 04	14 75	79 20	48 48
Lanark	18 12	7 18	2 25	7 24	34 79	33 53
Leeds	24 03	11 80	3 50	9 77	49 10	43 58
Lennox & Addington	23 08	11 14	3 35	8 11	45 68	39 91
Lincoln	101 46	37 24	8 76	14 27	161 73	70 14
Manitoulin	6 48	2 60	92	3 68	13 68	43 28
Middlesex	50 44	22 99	5 97	17 79	97 19	53 34
Muskoka	5 58	2 59	92	2 17	11 26	46 35
Nipissing	9 10	2 92	1 50	2 80	16 32	41 62
Norfolk	38 21	18 90	5 29	12 10	74 50	51 09
Northumberland	35 07	18 39	4 74	13 06	71 26	45 29
Ontario	40 17	19 18	4 65	15 63	79 63	52 83
Oxford	52 19	25 76	6 85	19 13	103 93	60 82
Parry Sound	4 97	2 21	86	2 37	10 38	41 50
Peel	53 43	25 81	5 57	17 03	101 84	52 97
Perth	45 82	24 62	6 11	19 03	95 58	56 72
Peterborough	21 77	9 42	2 38	7 15	40 72	42 37
Prescott	43 13	17 66	5 24	10 77	76 80	47 67
Prince Edward	34 58	19 12	5 92	11 57	71 19	43 23
Rainy River & Kenora	8 11	1 97	89	2 01	12 98	43 56
Renfrew	14 82	5 61	1 94	5 29	27 66	37 53
Russell	41 27	15 63	5 18	10 93	73 01	51 98
Simcoe	32 81	15 76	4 32	11 99	64 88	46 01
Stormont	32 76	16 53	4 74	12 49	66 52	53 41
Sudbury	8 93	2 38	1 19	2 11	14 61	38 94
Thunder Bay	8 69	1 48	63	1 37	12 17	49 34
Timiskaming	9 58	1 87	1 06	1 58	14 09	44 64
Victoria	24 79	9 41	2 68	8 28	45 16	42 29
Waterloo	47 28	24 86	6 13	15 52	93 79	56 53
Welland	53 47	24 96	7 18	13 27	98 88	55 11
Wellington	36 83	20 02	4 72	14 80	76 37	49 40
Wentworth	68 80	28 85	7 31	15 42	120 38	65 10
York	66 33	26 34	5 72	15 78	114 17	58 08
The Province.						
1916	31 67	14 24	3 91	10 52	60 34	48 93
1915	31 76	14 10	3 80	10 19	59 85	48 06
1912	30 47	13 46	3 46	9 07	56 46	44 80
1902	25 49	10 00	2 62	5 93	44 04	32 43
1892	27 19	8 64	2 25	5 19	43 27	30 38
1882	32 23	6 76	1 89	4 10	44 98	24 52

CHEESE FACTORIES.

TABLE XXIV.—Showing by Counties of Ontario the number of cheese factories in operation, the quantity and value of cheese and butter made, and the value of cream, casein and milk sold in 1916, together with comparative figures for the Province for 1909–1916.

Counties and Districts.	Cheese factories.				Butter plants at Cheese factories.			
	No. of factories.	Milk used for cheese.	Cheese made.	Value.	Number operated.	*Butter made.	Value.	Value of milk, cream and casein sold.
		Lbs.	Lbs.	$		Lbs.	$	$
Brant	6	7,235,991	613,557	107,196	....	.....	.....	.....
Bruce	5	5,859,876	529,731	93,830	....	.....	.....	.....
Carleton	51	59,622,895	5,460,824	1,003,335	4	13,880	3,614	.....
Dufferin	2	1,555,234	144,110	25,847	....	.....	.....	.....
Dundas	60	86,761,686	8,828,154	1,430,889	11	41,643	12,274	.....
Durham	2	1,636,654	152,792	28,312	....	.....	.....	.....
Elgin	16	42,389,243	3,711,520	673,166	....	.....	.....	47,460
Frontenac	66	78,771,416	7,156,179	1,323,609	15	55,648	16,102	.....
Glengarry	73	73,639,248	6,967,019	1,314,459	2	11,752	4,351	.....
Grenville	45	56,624,331	5,135,545	945,888	4	72,861	23,971	1,412
Haldimand	3	4,976,594	445,944	81,025	1	66,664	23,333	.....
Hastings	76	109,065,652	9,825,854	1,807,493	....	.....	.....	.....
Huron	5	7,349,437	649,205	114,368	....	.....	.....	.....
Lambton	5	6,329,212	581,209	106,817	2	35,218	11,852	.....
Lanark	43	52,283,123	4,777,467	919,745	10	75,506	24,831	.....
Leeds	97	142,482,475	12,805,443	2,378,195	34	136,392	38,590	.....
Lennox and Add.	30	67,392,122	6,274,546	1,259,588	3	11,794	3,332	.....
Lincoln	1	1,434,798	133,959	24,161	....	.....	.....	.....
Middlesex	25	61,220,786	5,427,711	992,755	2	71,281	22,356	.....
Norfolk	8	13,352,366	1,155,022	210,063	....	.....	.....	.....
Northumberland.	37	51,817,151	4,611,552	830,898	....	.....	.....	.....
Oxford	35	117,736,201	10,316,797	1,888,047	12	312,734	106,619	65,859
Perth	23	53,556,966	4,783,371	866,318	6	339,890	110,109	59
Peterborough	34	35,130,172	3,137,323	577,270	10	64,143	20,165	.....
Prescott	67	55,258,741	5,180,115	958,858	1	1,759	704	.....
Prince Edward	22	50,283,245	4,393,676	890,659	10	65,032	18,368	977
Renfrew	17	15,846,223	1,496,222	278,242	1	2,968	831	.....
Russell	62	53,580,596	5,051,002	908,666	4	17,179	5,404	.....
Stormont	50	80,749,117	7,388,839	1,326,339	2	4,173	1,263	7,655
Victoria	8	8,454,841	756,322	140,681	....	.....	.....	.....
Waterloo	2	3,911,748	369,998	68,450	....	.....	.....	.....
Wellington	3	4,070,050	356,613	63,405	1	16,867	5,493	.....
Wentworth	1	874,026	81,322	14,769	....	.....	.....	.....
The Province:								
1916	980	1,411,252,216	128,698,943	23,653,343	135	1,417,384	453,562	123,422
1915	995	1,367,247,741	124,991,026	18,864,386	155	1,522,316	439,710	40,958
1914	968	1,115,811,492	101,712,336	13,602,745	159	1,500,215	402,580	74,531
1913	1,002	1,209,890,007	110,795,926	13,890,656	154	1,562,294	426,216	172,657
1912	1,055	1,405,921,858	129,653,063	16,574,573	144	1,765,950	505,532	132,731
1911	1,077	1,369,856,680	127,123,016	15,491,406	157	1,963,768	491,448	164,412
1910	1,102	1,451,244,620	135,521,390	14,491,410	....	.....	.....	.....
1909	1,177	.....	125,611,359	14,193,918	....	.....	.....	.....

*Including 367,071 lbs. whey butter, valued at $112,993 in 1916.

NOTE.—The statistics in this and following table have been compiled by this Bureau from returns made by the staff of instructors under the direction of the Dairy Branch of the Ontario Department of Agriculture.

CREAMERIES.

TABLE XXV. Showing by counties of Ontario the number of Creameries in operation, the quantity and value of butter made, the value of cream, casein and milk sold in 1916, together with comparative figures for the Province for 1909-1916.

Counties and Districts.	Creameries.			
	No. of Creameries.	Lbs. of Butter.	Value of Butter.	Value of milk, cream and casein sold.
			$	$
Brant	5	918,650	311,095	.....
Bruce	9	1,803,564	583,107	.....
Carleton	4	818,334	253,341	.....
Dufferin	2	378,000	124,740	.....
Durham	2	95,624	25,929	.....
Elgin	7	501,560	165,560	12,826
Essex	4	188,000	59,650	6,930
Grey	7	886,467	284,831	.....
Haldimand	8	1,508,141	493,702	.....
Halton	1	230,000	73,600	.....
Hastings	2	789,551	116,548	500
Huron	10	1,938,745	633,933	.....
Kent	7	411,000	141,560	.....
Lambton	8	1,392,848	460,054	.....
Lanark	1	23,625	7,088	.....
Lincoln	4	433,364	134,423	14,475
Middlesex	8	2,125,350	705,526	.....
Norfolk	6	790,292	261,268	49,392
Northumberland	1	192,443	54,458	.....
Ontario	6	540,610	158,970	.....
Oxford	4	304,437	106,934	210,969
Perth	8	1,172,993	385,850	45,772
Peterborough	3	185,862	54,547	23,039
Renfrew	2	265,961	76,613	.....
Simcoe	3	225,900	74,547	.....
Stormont	1	46,999	13,984	.....
Victoria	6	547,784	153,480	.....
Waterloo	5	916,994	296,629	6,256
Welland	3	268,031	85,770	.....
Wellington	5	1,913,146	631,123	.....
Wentworth	4	138,061	46,641	.....
York	9	3,701,137	1,205,963	211,140
The Province.				
1916	155	25,653,473	8,181,464	581,299
1915	151	24,566,430	6,928,923	277,847
1914	167	23,104,537	6,115,425	122,674
1913	155	20,629,555	5,318,435	290,637
1912	136	15,835,801	4,451,339	167,277
1911	120	13,738,203	3,268,303	.....
1910	121	12,893,650	3,016,135	.....
1909	97	9,015,206	2,175,955	.....

PART II.—CHATTEL MORTGAGES.

Table showing by County Municipalities of Ontario the total number and amount of Chattel Mortgages on record and undischarged on December 31st, 1916, against (1) all occupations; (2) farmers; together with totals for the Province for the past five years.

Counties and Districts.	Chattel mortgages against all occupations.				Chattel mortgages against farmers.			
	To secure existing debt.		For future indorsation.		To secure existing debt.		For future indorsation	
	No.	Amount.	No.	Amount.	No.	Amount.	No	Amount
		$		$		$		$
Algoma	202	991,160	....	.....	112	32,267	..	.....
Brant	137	409,699	....	.....	49	42,938	..	.....
Bruce	228	114,070	8	3,463	142	50,392	8	3,463
Carleton	264	366,973	5	5,344	43	22,960	1	170
Dufferin	67	56,056	....	.....	34	22,231	..	.....
Elgin	295	242,134	....	.....	135	57,558	..	.....
Essex	317	165,726	....	.....	194	62,409	..	.....
Frontenac	251	160,652	....	.....	173	64,670	..	.....
Grey	381	217,841	1	800	223	113,321	1	800
Haldimand	82	62,130	....	.....	42	20,597	..	.....
Haliburton	57	239,816	....	.....	44	6,785	..	.....
Halton	63	310,181	....	.....	24	21,300	..	.....
Hastings	405	158,624	....	.....	226	85,952	..	.....
Huron	165	186,622	....	.....	90	105,834	..	.....
Kenora	52	146,137	....	.....	17	8,166	..	.....
Kent	415	547,531	....	.....	304	139,471	..	.....
Lambton	284	152,163	....	.....	126	61,665	..	.....
Lanark	119	134,411	....	.....	56	33,218	..	.....
Leeds and Grenville	269	188,711	....	.....	171	107,526	..	.....
Lennox and Addington	141	68,985	1	600	81	39,897	1	600
Lincoln	135	128,697	2	3,800	29	15,747	..	.....
Manitoulin	118	35,398	....	.....	102	22,045	..	.....
Middlesex	232	233,454	....	.....	93	109,343	..	.....
Muskoka	157	73,369	1	16,168	55	18,735	..	.....
Nipissing	248	246,099	2	1,018	101	27,829	..	.....
Norfolk	187	92,423	....	.....	137	43,891	..	.....
Northumberland & Dur	310	200,703	....	.....	182	108,050	..	.....
Ontario	182	118,060	1	40,000	108	57,589	..	.....
Oxford	191	184,878	....	.....	97	94,407	..	.....
Parry Sound	159	266,363	2	9,200	40	9,212	..	.....
Peel	46	35,248	....	.....	28	14,635	..	.....
Perth	110	135,807	....	.....	38	22,984	..	.....
Peterborough	146	147,117	2	1,150	81	34,781	1	900
Prescott and Russell	185	182,480	....	.....	110	65,231	..	.....
Prince Edward	98	74,074	....	.....	67	51,695	..	.....
Rainy River	120	50,706	1	16,000	73	14,712	..	.....
Renfrew	205	96,574	....	.....	135	57,761	..	.....
Simcoe	415	319,356	....	.....	280	117,999	..	.....
Stormont, Dun. & Glen.	221	184,915	7	3,935	137	105,538	3	535
Sudbury	321	†6,198,850	2	1,500	169	62,934	..	.....
Thunder Bay	161	*646,859	....	.....	58	19,353	..	.....
Timiskaming	478	322,368	6	(a)570,482	284	80,154	1	325
Victoria	74	50,482	....	.....	50	19,263	..	.....
Waterloo	158	219,626	....	.....	35	32,961	..	.....
Welland	181	179,943	6	(b)209,766	44	19,642	..	.....
Wellington	144	171,114	....	.....	62	93,951	..	.....
Wentworth	414	538,841	2	(c) 200,500	63	36,824	1	500
York	1,497	2,212,654	1	1,500	99	55,923	1	1,500
The Province								
1916	11,087	18,266,080	50	1,085,226	5,043	2,512,346	18	8,793
1915	12,010	12,432,780	49	699,942	5,178	2,579,303	14	4,056
1914	10,881	28,164,771	60	6,365,509	4,791	2,444,406	16	17,627
1913	10,190	32,442,616	49	8,485,788	4,831	2,279,301	16	4,012
1912	10,654	39,406,857	55	542,235	5,016	2,310,071	6	3,489

*Including 1 Dock Company for $250,000; (a) Including 4 Miners for $569,157; (b) Including 2 Hotel Companies for $200,000; (c) Including 1 Cotton Company for $200,000; † Including 1 Nickel Corporation for $6,000,000.

REPORT

OF THE

Trades and Labour Branch

INCLUDING

A Brief Summary of the Organization of the Trades and Labour Branch

AND THE

TWENTY-NINTH ANNUAL REPORT

OF THE

Factory Inspection Branch

DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

PROVINCE OF ONTARIO

1916

(Published by the Ontario Department of Public Works)

PRINTED BY ORDER OF

THE LEGISLATIVE ASSEMBLY OF ONTARIO

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1917

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Toronto.

To His Honour Sir John Strathearn Hendrie, a Lieutenant-Colonel in the Militia of Canada, etc., etc., etc.,

Lieutenant-Governor of the Province of Ontario.

May it Please Your Honour:

I have the pleasure to present herewith for the consideration of Your Honour the Report of the Factory Inspection Branch for the year 1916.

Respectfully submitted,

F. G. Macdiarmid,

Minister of Public Works and Highways.

Toronto, 1916.

A BRIEF SUMMARY OF THE ORGANIZATION OF THE TRADES AND LABOUR BRANCH

W. A. Riddell, Ph.D., Superintendent.

The Trades and Labour Branch Act, came into force by an Order-in-Council, approved by His Honour, the Lieutenant-Governor, the 6th day of July, 1916. The Superintendent who is to administer the Act was appointed August 24th, 1916, and took up the duties on the 9th of September following.

The Trades and Labour Branch Act charges the Superintendent with the administration of the Bureau of Labour Act, The Stationary and Hoisting Engineers' Act, The Building Trades Protection Act, The Factory, Shop and Office Building Act, The Steam Boiler Act, the Employment Agencies Act, together with the establishment and maintenance of Employment Bureaux at different centres in the Province, as well as investigation and research regarding matters directly affecting the interests of the industrial classes.

The specific work of the Branch has included all three of the divisions outlined in the Act, namely, administration, establishment of Employment Bureaux, and investigation and research. The aim has been to co-ordinate the work of the different departments and to secure more efficient administration of the various Acts.

Seeing that the Trades and Labour Branch Act incorporates practically all of the Bureau of Labour Act, the work of the Bureau of Labour has been merged under that of the Trades and Labour Branch. Mr. Robert Edgar, Secretary of the Bureau of Labour, has been appointed Superintendent of the Men's Department of the Ontario Government Public Employment Bureau, Toronto.

The Ontario Commission on Unemployment appointed by the Ontario Government on December 20th 1914, strongly urged the establishment of a Provincial system of Employment Bureaux. The Interim Report of July 20th, 1915, stated, "The Ontario Commission on Unemployment has unanimously agreed that some form of public employment office should be established by the State to replace the system now in operation in Ontario, which is in urgent need of being modernized and made efficient."[1]

The organization of industry is now so far-reaching and the demand for labour so fluctuating that the individual workman, however able, willing and skilled he may be, may not succeed in finding employment at the work he can do best, although employment might be available if the labour market were properly organized. It is evident that the worker should not be required longer to bear the burden of finding a job by his own unaided efforts. Immigrants trained in agriculture come into the cities and towns with the raw material of common labour. An increasing number of women seek industrial employment, but for the most part without direction. What has been done to regulate the labour market, or to gain real knowledge concerning it, has been sporadic and inadequate."[2]

With reference to ways and means of meeting the unemployment situation it stated: "Your Commission is convinced that nothing but a properly constituted State Employment Bureau can make the above plans and policies effective." In the complete report of the Commission in 1916, similar recommendations were made.[3] At the time the Trades and Labour Branch Act came into force small

[1]Ontario Commission on Unemployment (Interim Report) p. 5.
[2]Ontario Commission on Unemployment (Interim Report) p. 6.
[3]Report of the Ontario Commission on Unemployment, pp. 41-45.

part-time offices were being maintained in Ottawa, Hamilton, Kitchener, St. Thomas, Brantford, London, and Walkerville. Two or three of these bureaux were doing fair placement work, considering the small expenditure of $300.00 per annum.

Owing to difficulties in the labour situation the Imperial Munitions Board petitioned the Government to open a number of Employment Bureaux to handle all employment work for munitions, especially that of diluting the labour forces with female workers. An employment bureau was opened at 164 Bay Street, Toronto, and in order to meet this situation in munitions, a Women's Department was opened at once, and later, as the demand grew, the Men's Department. The staff at present consists of three women and two men. Bureaux have since been opened at 139 Queen Street, Ottawa, 28 Main Street East, Hamilton, and at the corner of Talbot and Dundas Streets, London. In three of these places the Government had maintained small part-time offices as mentioned above. As the results from these were very unsatisfactory they were closed upon the opening of the others.

The opening of these offices, however, did not complete the policy which the Government had in mind to establish a Provincial-wide system of Employment Bureaux, although at the time these offices were opened the Government was considering very carefully this policy with regard to a Provincial-wide system. The system will follow, to some extent, that of the British Labour Exchanges—Zone offices will be established at present in six centres, namely, Toronto, Ottawa, Hamilton, London, Fort William, and Sudbury or Sault Ste. Marie. These offices will report daily to the Provincial Labour Exchange in the Labour Building, 15 Queen's Park, Toronto. Sub-bureaux will also be maintained in a number of the smaller cities, such as Brantford, St. Thomas, Kitchener, etc., reporting to the Zone Bureaux.

Connected with these Zone offices also will be the branch offices of the Provincial Department of Agriculture, which are to be found in forty-five towns and smaller cities in the Province. This use of the branch offices of the Department of Agriculture, under the direction of the District Representatives, is an entirely new departure and promises to be of great value in any successful scheme of employment bureaux for the Province of Ontario. The need for farm labour is always present in an Agricultural Province like Ontario and the problem of securing an adequate and satisfactory labour supply for the farms is imperative in increasing our agricultural production or in reducing the high cost of living. The linking up of the District Representatives of the Department of Agriculture with the Provincial Employment Bureau places a representative of the Bureau in almost every county in Ontario.

Through this close connection the whole labour forces of the Province can be drawn upon to meet the urgent need of labour on the land, and it is hoped to utilize the Provincial system of employment offices to the utmost in order to procure this adequate labour force.

An effort is being made at the present time to widen the scope of the Ontario Government Public Employment Bureaux through obtaining the co-operation of the Federal Government in permitting the use of the post offices in all of the smaller cities and outlying centres for the purpose of registration of applications for employment and help; all such applications would centre in the Zone office. Further, it is hoped that it may be possible to have a Federal Labour Exchange which will connect the Ontario Government Public Employment Bureaux with the Provincial Employment Bureaux of other Provinces.

Such a federal Employment Exchange would serve, first—as an Inter-Provincial exchange for employment; second—to be the statistical headquarters for all figures pertaining to employment conditions throughout Canada; third—to standardize and print the forms which would be used in all the employment bureaux.

The diagram facing this page will illustrate the co-ordination of the proposed system of Employment Bureaux.

Such a plan as outlined will enable the Ontario Government Public Employment Bureaux to be in close touch continually with the opportunities for employment in every rural and urban centre in Ontario. Every facility afforded by these bureaux will be available to every citizen without cost whether employer or employee.

The Trades and Labour Branch has been moved from the Parliament Buildings and now occupies No. 15 Queen's Park, Toronto. The Superintendent of Trades and Labour, Factory Inspection Branch, Boiler Inspection Branch, and the Stationary Engineers' Board, will be found in this building.

For the Annual Report of the Chief Inspector of Boilers for 1916 see the Report of the Department of Public Works and Highways, 1916.

OFFICIAL LIST, 1916

CHIEF INSPECTOR: JAMES T. BURKE, PARLIAMENT BUILDINGS, TORONTO.

INSPECTORS:

W. T. E. BRENNAGH, 156 Winnipeg Ave., Port Arthur: Mr. Brennagh's district is Sudbury, C.P.R. and C.N.R. lines south to Parry Sound (exclusive); east to Algonquin Park; north from Scotia Junction to North Bay; Cobalt district to Quebec boundary lines; north to Manitoba boundary line.

H. A. CLARK, 242 Dovercourt Rd., Toronto: Mr. Clark's district is Toronto, east of York Street, University Avenue and Avenue Road; to Don River; north to Jackson's Point (Metropolitan); south including islands in the Bay.

A. W. HOLMES, 39 Lakeview Avenue, Toronto: Mr. Holmes' district is Toronto east and south of Lansdowne and Bloor Streets; west to Burlington; north to city limits; east, including York Street, University Avenue and Avenue Road; south to the Bay.

R. HUNGERFORD, 434 Shaw Street, Toronto: Mr. Hungerford's district is Toronto, west of, but including Lansdowne Avenue and Bloor Street, also West Toronto, Lambton, Milton, Branchton, but excluding Drumbo, Stratford, Gowanstown, and Fordwich, but shall include north to Southampton, Bruce Peninsula, Owen Sound, Collingwood, Meaford, Penetanguishene and both C.P.R. and C.N.R. lines to Parry Sound (inclusive); Orillia, Elmvale to Toronto, G.T.R. points being included.

F. KELLOND, 157 Wellington Street South, Hamilton: Mr. Kellond's district is G.T.R. main line west to London (exclusive); east to Niagara Falls, south and east of London and Port Stanley lines; north to C.P.R. and G.T.R. to Drumbo, Crumlin and Tavistock (Milton, Branchton, and Ingersoll Junction being excluded).

S. J. MALLION, 74 St. Vincent Street, Stratford: Mr. Mallion's district is Fordwich, Gowanstown, Stratford, St. Mary's, London, St. Thomas and Port Stanley; south and west to border line, including Ingersoll Junction on C.P.R., and north, including Teeswater, Kincardine, Goderich, etc.

H. J. TUTT, 13 Enderby Road, Toronto (East): Don River, east including Kingston, K. & P. Railway; north to Sharbot Lake and Scotia Junction (exclusive); west to Coldwater Junction, but shall not include Orillia, Elmvale, Aurora or Downsview.

MISS M. CARLYLE, 68 Grace Street, Toronto: City of Toronto, west of Yonge Street, north to city limits; south to Niagara Falls; west to Windsor, but shall exclude West Toronto, Brampton, Georgetown, Guelph, Kitchener, Stratford, St. Mary's, Lucan Crossing and Sarnia.

MRS. A. BROWN-REDDICK, 437 Crawford Street, Toronto: City of Toronto, east side of Yonge Street to Quebec boundary line; to Ottawa, Mattawa, North Bay, Sudbury, Owen Sound, Wiarton, Southampton, Teeswater, Kincardine, Goderich, Sarnia, north to City of Toronto limits, to include West Toronto.

REPORT

OF THE

FACTORY INSPECTION BRANCH

Department of Public Works and Highways

PROVINCE OF ONTARIO

1916

To the Honourable the Minister of Public Works and Highways.

SIR,—I have the honour to submit to you the Twenty-ninth Annual Report of the work of the Factory Inspection Department for the Province of Ontario for the year (fiscal) ended October 31st, 1916.

In reviewing the year's work I find there are few outstanding features. The daily routine inspection has been kept up, and in general a satisfactory standard of conditions maintained, and while there is every indication that progress is being made, no improvement is so pronounced as to permit any marked change in reports from year to year.

A feature of the work has been the examination (under Sec. 14) of a very large number of blue prints in connection with the erection, alteration or extension of factories, shops or office buildings, involving the expenditure of large sums of money. Numerous additions have been made to various plants to facilitate the manufacture of munitions for which there is such pressing need. The submission of these plans to the Department for approval before proceeding with the work makes for expediency, being a great saving of time, work and expense.

Seventeen factories, textile, clothing and munition works, were visited by the Fair Wage Inspector from the Federal Government, accompanied by one of our own inspectors, for the purpose of ascertaining what the conditions were in regard to sanitation and wages in those places.

A slight change has been made in the arrangement of some of the Inspectors' districts; these will appear with the Inspectors' names on page 8.

A list of the cities, towns and villages visited, with the number of inspections in each is appended, as well as accidents in detail in each district.

During the year just closed 10,618 inspections were made in 452 cities, towns and villages.

1st inspections	7,493
2nd inspections and re-visits	3,125
Total	10,618

Employees in these factories and mercantile establishments numbered 243,118, males and females. About 200 children were dismissed being under 14 years of age; birth certificates were ordered for 350 others of doubtful age. All showed that the legal age had been reached.

The horse-power of some 4,000 boilers in the above factories amounted to 339,523. Electric power 237,769, water 159,153, and gas and gasoline 10,493.

A good many recommendations were made in connection with the safety of employees, sanitary conditions, conveniences, and other regulations of minor importance. Some irregularities were in evidence, but little difficulty has been experienced in having them remedied, and in few cases has it been necessary to invoke the aid of the courts.

Prosecutions.

Legal proceedings were taken in nine cases. Six of these were for employing children in contravention of the Act; one was for violation of Sec. 70 (Bake Shop Act), and one for failure to comply with the regulation relating to sanitation. They are as follows:

Levi and Labotsky, clothing manufacturers, Toronto, were prosecuted for failing to comply with orders issued to improve sanitary conditions. Conviction was secured and fine imposed.

E. T. Wright, Hamilton, charged with employing child labour, claimed that the boy had been engaged by W. Morkin, a sub-contractor. The charge was then laid against Morkin, who was convicted, but the Magistrate held that the breach of the Act was unintentional and no penalty was imposed. Oswald Cummings, father of the boy was also indicted, but the case against him was dismissed.

Information was laid against the Mercury Mills, Hamilton, for employing child labour in contravention of the Act. Convicted and fined.

James Shea, superintendent at the Guelph Cotton Mills, Guelph, was prosecuted under Sec. 79 for employing child labour. He also was convicted and fined.

K. Silverstine, a baker, Toronto, was found guilty of a violation of Sec. 70. He was allowed to go on suspended sentence.

The Moore-Telford Co., Toronto, charged with the employment of child labour, was convicted and fined. The parents were also prosecuted but allowed to go on suspended sentence as the child had received a permanent injury.

Information was laid against John Hilton for allowing his daughter to work before attaining the legal age of 14. The manager of the firm she was employed with gave evidence and was found to be in no way to blame, having been misled as to her proper age. Hilton was convicted and fine imposed.

Two other cases in which the Inspectors were witnesses came up. One, proceedings taken by the Crown against J. M. Lowe, in connection with an elevator accident, was laid over. The other, something in the way of a conflict of authority, was in regard to a fire escape ordered by this Department, and erected by Eberhard and Wood, under the impression that the owner was the possessor of three or four feet more of the property than he actually was. The fire escape thus came over the street line, which the City claimed was irregular as they had not given permission to so erect it. This case also was laid over.

Overtime Permits.

Exigencies of trade caused us to issue the following overtime permits:

Regular under Section 34	192	
Special under Sec. 32 (Military Contracts)	35	
Special under Section 70 (Bake shops) setting sponge...	9	(English)
Special under Section 70 (Bake shops) setting sponge...	2	(Yiddish)
Sunday work	13	
Holiday trade	7	
Total	258	

This is an increase of 52 over last year, 206 being granted in 1915.

Reasons assigned on application were shortage of labour and consequent delay in getting out orders, and also to increase the output in munition plants and factories engaged on other military contracts.

The Master Bakers applied for special permission under Sec. 70 to enable them to begin baking bread at 2 p.m. (Sunday afternoon) to be subsequently followed by day work. The Department endeavored to co-operate with them but their organization was not complete.

Several cases of illegal overtime were reported. In some instances the excuse was that the pressing demands for munitions seemed a justification for a breach of the Act. Permits to employ females on night work are only issued when assurance is given that the production is solely for the use of the Militia Department.

Explosions.

Several disastrous explosions took place during the past twelve months, attended in some instances by loss of life and great damage to property.

An explosion and fire occurred in the loading plant of the Canadian Explosives, Ltd., Nobel, causing the death of one man and injuring three others. Another explosion took place in the charging house of the same firm, resulting in the death of seven employees and injury to about twenty more. The cause of both explosions is unknown.

At the Dupont Fabrikoid Co.'s plant, Toronto, a coating machine exploded, but fortunately no one was injured. The cause of this is also unknown. One also occurred in the dry cleaning plant of the West End Laundry Co., Toronto, badly wrecking the building; no one was injured. Cause unknown.

An explosion took place in the American Cyanamid Co.'s plant at Niagara Falls, injuring four employees and damaging the plant to some extent.

In another factory, the Chapman Ball Bearing Co., Toronto, a baking oven used for drying shells exploded. The air was shut off and gas turned on, and when turning on the air again the explosion occurred. Minor damage was done to the building, but no one was injured.

Two men were killed and three others injured through the explosion of a steam pipe in the Greey Mfg. Co.'s factory, Toronto. On investigation it was found that the throttle valve of engine and flange had blown out, the cap screws which held it in place being defective.

Only one boiler explosion was reported. This occurred in the Hayne Heading Mill, near Millbridge, when the centre one of three boilers exploded, the force being so great that it toppled over a portable boiler next to it and landed 25 yds. out in the lake. A boy, son of the manager, was injured.

An investigation was made into an occurrence at the Canadian Explosives, Ltd., Nobel, whereby five small buildings used for drying gun cotton were blown up and three others badly wrecked. Little information could be obtained as to the cause, but recommendations were made that greater precautionary measures be taken to guard the plant.

The explosion and fire which occurred at the Quaker Oats Co.'s plant, Peterborough, one of the largest cereal mills in the Dominion, was perhaps the most disastrous of all. The loss of life was great and the plant was completely destroyed; adjacent buildings were also damaged to a great extent. It was difficult to arrive at a conclusion as to the exact cause of the explosion, but the supposition is that a spark from the grinders ignited the dust, which in turn ignited gas that

may have been generated from dust accumulated in places not easy to get at, although precautions had been taken and systems installed to prevent any such occurrence. It was learned that several minor explosions caused by combustion—which is not infrequent in milling plants—had occurred previous to this one, but none had caused fire. The explosion, caused by fire in the dry house, which was located near the boiler house, blew out the walls and wrecked the steam plant, rendering the steam pump useless. The plant was also equipped with a sprinkler system, but this too was put out of commission by the explosion. An examination of the boilers showed them to be intact and there was no evidence of explosion from them.

Accidents.

During the past year 2,474 accidents were reported, 58 of which were fatal—an increase over last year in both fatal and non-fatal—944 accidents being reported in 1915 with 52 fatalities. This increase is to a certain extent the result of a better observance of the law in regard to reporting, as well as to the revival in industrial activity. The misapprehension, too, under which many were labouring regarding reports to the Workman's Compensation Board being sufficient is also being removed, and firms that heretofore neglected to report accidents are now doing so.

As usual, the majority reported were of a temporary character, and largely due to causes other than machinery, and could only be avoided by the exercise of care on the part of the injured themselves. The manner in which some of the fatalities occurred is unaccountable, and little could be learned by investigation, the accidents not being witnessed, and conclusions could only be based on the supposition that owing to sudden illness from natural causes the deceased had fallen in the way of danger. Of course, there are instances where evidence points directly to the cause, and is frequently found to be the result of deliberate action or want of thought. This was the case in some elevator accidents which were not in any way due to defects in equipment. Employees sometimes appear to almost court danger. Belts and shafting were responsible for several fatal accidents, the men being drawn into danger by their clothing being caught. Explosions were responsible for 47 accidents—24 fatal. A large percentage of the non-fatal were caused by falling substances, rails, shells, etc., molten metal and other burns and scalds, cuts on ragged edges and being jammed between articles. Some were reported where there was no record of the accident, no information given except a doubt expressed as to the genuineness of the accident. Fatal accidents are as follows:

J. L. Miller, an employee of the Algoma Steel Co., Sault Ste. Marie, while getting down out of Spike Mill crane was caught by crane in Merchant Mill, and crushed between truck and girders.

Byll Syvotink, also an employee of this company, was drowned in a sewer hole; he is supposed to have overbalanced and in the descent struck his head and was rendered unconscious, causing him to drown.

James Mearns, another employee, died from injuries. He was repairing a train line when another car was switched into track on top of flat car he was working on. His leg was crushed and had to be amputated.

Fatimo Emanuel, employed in the C. P. R. Roundhouse, Fort William, fell into a drop pit containing hot water and was scalded to such an extent that he died the same afternoon. On account of the steam in the shop during cold weather he could not see where he was going.

August Jorgenson, an employee of the Fort Frances Pulp and Paper Co., Fort Frances, was killed by electricity. He was building a framework to protect generators, and when stepping between high tension cables, slipped and fell across another cable, forming a circuit.

Wavero Duneski, an employee of the Grain Growers Grain Co., Fort William, was passing between cars in the elevator when the train came and struck them, crushing him.

Frank Cruise, employed by the Lake Superior Paper Co., Sault Ste. Marie, was drawn into a press and his chest was crushed; while he was pulling up slack the machine accidentally started.

Arthur Oliver, employed by N. M. Paterson & Co., Fort William, while oiling rope drive became entangled and sinews of arm were severed, resulting in lock jaw, from which he died.

Edward Samuel Wheelock, an employee of the Spanish Mills Co., Cutler, fell and fractured his skull.

R. McFarlane, an employee of the Western Terminal Elevator Co., Fort William, while passing between box cars was squeezed between draw bars. Died from the result of injuries.

Arthur Brunni, employed by the Imperial Optical Co., Toronto, was caught by elevator and decapitated. He attempted to board elevator while in motion.

H. Mills, while oiling shafting on one of the machines, was thrown down when machine started and skull was fractured. He was an employee of the Amalgamated Ammunition Machinery Co., Toronto.

Giovanni Marcencie, employed by the St. Lawrence Starch Co., Port Credit, was hit on the head by the handle of a winch and died next day.

Charles Paquette, an employee of the Canadian Explosives, Ltd., Nobel, died from the effects of inhaling acid fumes. He was cleaning wringer in nitration house, next to one that had just fired, before the fumes had entirely disappeared. Apparently he was anxious to prevent any possibility of his own wringer firing.

Edward Humphries, another employee of the Canadian Explosives, Ltd., died as the result of burns received from fire and explosion in loading plant.

F. A. St. Dennis, C. Smith, W. H. Wire, J. Malboeuf, Howard Quinn, Harry Dolgay and W. Flynn, all employed by the Canadian Explosives, Ltd., were killed by explosion in charging house. The cause of the accident remaining a mystery.

Austin Berry, employed by the General Supply Co. of Canada, Ottawa, fell into elevator shaft from shipping room floor to pit floor and fractured his skull.

Andrew Picard, employed by James Cluff, Lumber Mfg., Maxville, fell across circular saw and was cut in two.

A. Mear, an employee of the Riordan Pulp & Paper Co., Hawkesbury, met with instant death. He was caught between elevator and brace on elevator shaft. Elevator started while he was getting off.

Percy S. Kerr, employed by the Rideau Power Co., at Merrickville, died from injuries. He was adjusting a belt on pulley on main shaft when his sleeve caught on a set pin in coupling connecting water wheels and generator, and he was thrown several feet high. Skull, arms and legs were broken and he also sustained internal injuries.

Frank Welk, employed by Welk & Tank, Eganville, was caught on projecting set screw and wound round shaft.

J. T. Galt, an employee of the Ford Motor Car Co., Ford, sustained a severe scalp wound and fracture of collar bone from which he died; he was looking over

the gate and elevator caught his head forcing it down between floor of elevator and the gate.

Joseph Susko, employed by the London Rolling Mill Co., London, fell and fractured skull, jaw also broken. He was grinding shear blade.

Bert A. Bailey, employed by the Anglo-Canadian Leather Co., Bracebridge, was caught between drum wheel and shafting and injured internally. Died as result.

Charles Powell, employed by the McLagan Furniture Co., Stratford, was struck on the top of head by blade of re-saw which broke.

William McGee, an employee of the Collingwood Ship Building Co., Collingwood, was killed by fall to the bottom of boat. He was leaving his work and walked into upper deck hatchway, falling 25 feet.

George Fyke, employed by the Maple Leaf Condensed Milk Co., Chesterville, was killed by the collapse of a water tank in course of construction. Cause of collapse is unknown.

Louis Chevalier, an employee of the St. Lawrence Brewery, was killed by shock from an electric switch.

Omer Latour, also an employee of the above firm, was killed in the same manner.

A. Saylor, employed by the Ford Motor Co., Ford, died from a fracture at base of skull. He was patrolling yard of power house and stepped into hole in floor of new house under constructton and fell 15 feet.

Wesley Misner, employed by the Lufkin Rule Co., Windsor, fell backward off platform and struck his shoulder and head rendering him unconscious. Subsequently reported fatal.

Charles Elson, employed by the Consumers' Gas Co., Toronto, while stooping over to drink at a fountain was caught by the arm on stoking machine and crushed against shaft casing. Died as the result of injuries.

Karol Knoeski, an employee of the Trout Creek Logging Co., Trout Creek, was crushed by falling logs while attempting to dump same at mill.

Edward Gracey, an employee of Bean & Westlake, Woodstock, was caught in elevator shaft and sustained internal injuries; neck and spine were also injured.

Roy Clinton Trembly, employed by the Brook Woolen Co., Simcoe, while assisting another man to lace a belt running from main line shaft to elevator hoisting machinery was caught in some unaccountable manner in shafting and killed.

Giovanni Carella, employed by the Canadian Billings Spencer Co., Welland, reached or fell through drop hammer, at the same time putting foot on treadle releasing ram, which fell on his head killing him instantly.

Donato Mangina, an employee of the Canada Glue Co., Brantford, was caught in shaft and wound round it. His skull was fractured and both legs broken.

Witt Lsevael, employed by the Canadian Steel Foundries, Welland, had his skull crushed and died in a few minutes. The eye of beam became detached from crane and fell.

Alfred Straight, employed by Canadian Westinghouse Co., was struck by freight train while crossing G. T. R. spur line driving auto truck.

Grafield Schafer, an employee of the Dominion Steel Foundry, Hamilton, was hit on the head by a block from crane and skull was crushed.

Wasyl Mistukewicz, employed by the Electro Metals, Ltd., Welland, had skull fractured and body crushed. Electrode and holder were knocked over by chain from crane and fell on him.

John Whitford, also an employee of the Electro Metals, Ltd., Welland, was drawn into conveyor mechanism and had both arms taken off and head crushed. In some way he got his sleeve between belt and pulley.

Farrar Horn, employed by the Frost Wire Fence Co., Hamilton, was caught in wire block and carried around, his head striking plate or plate stand each time the block went round.

George Lennox, employed by Goold, Shapley & Muir Co., Brantford, was caught in line shaft of gas engine and killed.

J. Hackbush, an employee of the Greening Wire Co., Hamilton, died from blood poisoning, the result of a scratch from a piece of wire.

Fred Hurse, an employee of the Harvey Knitting Co., Woodstock, fell down elevator shaft from second floor to basement and was killed.

Edward Brucknir, employed by the International Harvester Co., Hamilton, was found dead. He is supposed to have fallen forward on the machine while changing dies, and in some unaccountable manner, hammer was tripped and came down on his jaw.

John Johnston, employed by J. Johnston, Brantford, was killed by a blow over the heart from dough mixer.

Edward Steadman, employed by Steadman Bros., Brantford, was killed on elevator. Is supposed to have fainted when starting elevator and fell in such a position that he was caught by the floor.

Louis Santama, an employee of the Steel Co. of Canada, Hamilton, was instantly killed. He went between two castings and steel blocks off them fell on him.

MACHINES AT AND CAUSES THROUGH WHICH ACCIDENTS OCCURRED.

Air compressor	1	Electricity	21
Acid fumes	1	Emery wheels	22
Arbor	1	Ending machine	1
Automatic welder	1	Elevators	30
Air hoist	1	Equalizers	1
Barker	12	Forming machine	1
Boring machines	9	Foreign substance in eyes	45
Blood poisoning or infected wounds	59	Flying missiles	54
Binder knives	1	Falling substances	498
Bolter	1	Fly wheels	4
Burns, molten metal and other	201	Falls	162
Belts, pulleys and shafting	53	Frame groover	1
Bailing machine	1	Framing tools	1
Cut off machines	3	Fan	2
Cranes	38	Feeding machine	1
Cams	2	Feed pump	1
Cutting machines	8	Faller	1
Corner cutting machines	1	Grinding machine	15
Chucks	4	Hoppers	1
Cogs, gears and sprockets	26	Hammers	40
Chopper	1	Hand tools	26
Chains, blocks, hooks and cables	69	Hoisting chute	1
Carding machines	3	Hay cutting machine	1
Calendar	1	Jammed between or against articles.	166
Carriage	2	Jointers	6
Cambering machine	1	Knives	4
Coping machine	2	Knitting machines	3
Conveyors	4	Locomotive cars, engines, etc.	31
Dies	5	Looms	3
Drills	24	Lathes	33
Derricks	2	Milling machines	6
Drowned	1	Mower frames	2
Explosions, boiler	7	Mixer	1
Explosions, other	40	Mint machine	1

Machines at and Causes Through Which Accidents Occurred.—*Continued.*

Nailing machine	1	Shears	44
Presses	64	Sander	1
Picker	4	Soap press	2
Punch	21	Stoking machine	1
Planer	18	Stencil	1
Printing press	1	Stamping machine	1
Painting machine	1	Screw machine	2
Pump	1	Scale spout	1
Paper drum	1	Scaffolds (collapse)	5
Paper cutter	1	Shaper	6
Rolls	12	Spindles	3
Reamer	2	Spinners	5
Ripper	2	Splitter	2
Reeling machine	1	Threading machine	2
Rivetter	1	Tapping machine	1
Rimming machine	1	Twisting machine	1
Scraper	2	Veneer clipper	1
Set screws	6	Waste machine	1
Spinning frame	3	Winder	2
Spooling machine	1	Wrapping machine	1
Slotter	2	Winch	1
Saws	62	Worsted drawing machine	1
Sand-papering machine	1	Wrench	2
Soldering machine	1	Others, such as striking against objects, ragged edges, trucks, blows, etc.	295
Sprains, strains and ruptures	90		
Straightening machine	19		
Skein cutter	1		

Safety.

While other regulations have received due attention from the Inspectors, those relating to the safety of the employee have been, as always, the first consideration, and for this reason a large number of recommendations were made in connection with guarding or fencing dangerous machinery, the proper equipment of elevators and hoists, and adequate fire protection, and for the most part manufacturers have endeavoured to respond to the inspectors' efforts to minimize the number of accidents due to preventable causes. A large number of the orders given were in the country districts, where less attention appears to have been given to these requirements. Machines are frequently found unguarded, but not in use at time of inspection; nevertheless notice is given to have them provided with safeguards before using again. Many are willing to comply with recommendations, but lack initiative, and in these cases the Inspector is very often in a position too suggest measures of safeguarding. It is true that some machines are more difficult to guard than others, and where a guard is clumsy and in the way, and impedes the work, the tendency is to remove it. The method of guarding a machine means a great deal.

A fatal accident occurred in one of the large steel plants through a car which was switched on to track running up on another car on which a man was working; when investigating this, the Inspector was shown a device for preventing accidents in railway yards. The Inspector says, "the management are purchasing derailing machines to be distributed among the car repairers and painters, to be fastened to the track rail a short distance in advance of where the men are working under or on cars in the yard, and if the cars are shunted and flags disregarded, the running car is ditched by the use of this new invention. A key which is used to unlock the machine from the rail is carried by a workman, who is responsible for same." This invention should be used in all railway yards.

Complaints.

A large number of complaints of the usual order were received during the year from various sources. All received full consideration and where sustained, remedied as far as possible. Chief among them were child labour, hours of employment, insanitary conditions, temperature; others were of less consequence. Four related to the safety of employees. Another was of a clothing factory being a sweat shop; this was looked into but there was little ground for complaint, the place being in a very fair condition.

Frequently grounds for complaints are of a temporary character, and although perhaps inconvenient, are not serious and can easily be adjusted.

Mode of Wearing the Hair.

Section 53 provides that where machinery operated by mechanical power is used, females shall wear caps, or have their hair arranged close to the head. In spite of this provision, and the endeavour of the Inspectors to have the regulation complied with, there are places where it is ignored altogether. Many warnings have been issued to both employers and employees pointing out the danger from non-observance, but with apparently little effect. In one factory, however, a girl was dismissed for not conforming with this requirement, and if this example were followed in other cases, a stricter observance of the law in this respect might result. While the regulation may be considered one of minor importance, serious accidents have occurred through non-compliance.

Sanitation.

Increased facilities for improved sanitation has resulted in improved conditions, and while a number of orders were issued bearing on the question of sanitation, few glaring defects were noted. A lack of general cleanliness is more in evidence than conditions which might be a menace to the health of employees, and many minor, but none the less important orders were given in connection with existing irregularities, such as cleaning closets and closet bowls, stairways, halls and sweeping, supplying towels and soap, light, etc. These are recurring recommendations; cleanliness depends so much on the viewpoint, and as occupiers of factories and shops do not always see eye to eye with the Inspector, attention has to be drawn to these requirements frequently, and sometimes several visits are made before a proper standard is reached.

An extremely insanitary condition existed in the rag sorting room of a factory inspected; it was found to be dirty and dusty, and little attention paid to cleanliness in any way. After several visits from the Inspector, the management promised to see that improvement was made, and orders issued have since been complied with, and a piping system for the removal of dust is being installed.

A want of co-operation on the part of the employees themselves sometimes creates insanitary conditions. This fact was demonstrated by the investigation of a complaint received, when it was found that the employees themselves were responsible, and they were accordingly warned that stronger measures would be taken if the occasion again demanded it.

Insufficient closet accommodation was complained of in another place; this, however, was found to be occasioned by an additional number of female employees

being taken on than were required in the first instance. A change in industrial conditions has been brought about by the war, and a firm ordinarily employing only four or five females, suddenly confronted with the necessity for taking on from twenty-five to one hundred more, is naturally not ready and arrangements have to be made after. Provision for this extra help is made in extension being built.

Child Labour.

Terms of the Factory Act prohibit the employment in factories of children under 14 years of age. Notwithstanding this there was an attempt made during the past twelve months to exploit child labour, parties alleging scarcity of adult labour as an excuse for thus violating the law. Thorough investigation was made into the matter with the result that many children were dismissed from the various factories, and legal proceedings taken against several employers and some of the parents. It is a common thing for a child to give a wrong age and be allowed to begin work before a birth certificate is sought or obtained. An impression obtained in some quarters that a child under 14 might work in a factory after school from four o'clock till six if he was advanced sufficiently to pass entrance examination. The fact, however, that a child holds an entrance class certificate does not permit him to work in a factory. A good many applications have been received for permission to employ child labour, but the proposition has not been favourably entertained, and employers have been urged to secure certificates of birth from young applicants before giving them employment.

Bakeshops.

Reports received from all districts on the bakeshops inspected this year are good. These places appear to be in excellent condition, clean, up-to-date, and conforming with the law in nearly every respect. Several in course of construction promised to be very fine places when completed. Improvements were being made in others, bath and dressing rooms provided for the use of bakers, travelling ovens installed, and in one a portable oven, gas heated, was being put in on the ground floor. In only one instance were conditions very unsatisfactory, and that was in a building quite unsuitable for the purpose for which it was used. In such cases it is difficult to have a proper standard of cleanliness maintained, and orders were issued to vacate the premises, as the place was unfit for the manufacture of bread.

An underground bakery—established prior to the law prohibiting the use of bakeshops below the level of the street—was found to be exceptionally clean and in good condition, an effort apparently being made to keep it one of the most sanitary in the place. Few irregularities were in evidence in the place visited, and beyond perhaps a few repairs, new floors or screens for doors or windows required, there was little fault to find. A complaint was received regarding a defective cess pool located next door to a bakeshop and looked into, and the use has since been discontinued as sewers have been connected with the house.

Several bakeshops have been visited owing to allegations made as to Sunday work, but no evidence was found of a breach of the Act in this respect.

Lunch Rooms.

The question of providing lunch rooms for females in factories has been before the Inspectors very often, and many employers have at their instance provided these rooms for the comfort of the employees, but the result is sometimes dis-

appointing. Special attention was given to the matter recently, but the idea is seemingly not a popular one with the majority of the girls and frequently the room is used by only a small number of them. Many prefer eating in the workroom, and there little groups of three or four will be found having lunch together. Their reasons for this is that conditions are not always agreeable at a common table, and besides, they like to have little confidential chats with their special friends, or perhaps a girl prefers to eat alone and read, and so on. The matter is difficult to adjust, and although it is obligatory on the part of the employer to arrange for these rooms, unless the girls are excluded from the workroom at the lunch hour the dining room falls into disuse.

Hours of Labour.

On account of the unusual conditions created by the war and the increasing number of females employed in the various industries, special pains were taken to see that the statutory hours were adhered to. The law does not allow females or youths to work in a factory in excess of ten hours in any one day, or more than sixty hours per week; females not to begin work earlier than seven in the morning, or work later than six-thirty in the afternoon, with one hour for the noon-day meal, and apportionment of hours can only be arranged between those hours.

A question arose of extending the hours for women owing to the necessity for increasing the output of munitions and other war materials, but was not considered, as it is believed that better results can be obtained from shifts on shorter hours.

In one factory it was found that hours in excess of the regulations were being worked in one of the departments without regard for the meal hour. Attention was called to the provision of 45 minutes for the evening meal, but it was stated that the help did not care to take advantage of the 45 minutes allowed by the Act, considering it a waste of time as they only took a light lunch, and had their regular meal when they went home.

A good deal of overtime has been worked during the year in nearly all kinds of industries, but particularly in those engaged in military supplies. The shortage of labour has also been a handicap to many firms, and this was a cause for granting overtime permits.

Fire Protection.

Every year a number of fire-escapes are erected, and the year just closed was no exception. New buildings are always being put up which require fire-escapes, and these must be erected according to Government specifications, necessitating consultations with all those concerned, otherwise questions arise which are difficult to adjust.

City officials take the stand that the city controls the streets and a fire-escape may not be erected that encroaches on the street, and if such permission is withheld, the owner has only the choice of erecting an additional inside stairway or rearranging his walls, something that is not easy to accomplish. These are things which should be taken into consideration by architects and owners in their plans.

Most of the places inspected during the year were well protected in case of fire, either by a fire-escape or two good inside stairways. What we have to contend with and frequently call attention to, is the blocking of passageways of fire exits, which if allowed to remain that way would make the means of escape provided ineffectual. A good many orders too were issued to have existing fire-escapes overhauled and painted, and put in good order generally.

TOWNS INSPECTED.

District No. 1.

Biscotasing	1
Blind River	2
Brennan's Harbor	1
Bruce Mines	1
Burk's Falls	3
Cache Bay	1
Callender	1
Chapleau	1
Cobalt	13
Cochrane	7
Cutler	1
Desbarats	1
Dryden	4
Emo	2
Espanola	2
Fort Frances	13
Fort William	164
Gore Bay	2
Graham	1
Haileybury	8
Iroquois Falls	2
Jacksonboro	1
Jarlsberg	1
John Island	1
Kearney	2
Keewatin	7
Kenora	18
Latchford	1
Little Current	3
McDougall's Mills	1
Magnetawan	2
Manitowaning	2
Marksville	1
Massey	1
Mowat	1
Nesterville	1
New Liskeard	5
Nicholas Siding	1
North Bay	15
Pine P.O. (Devon)	1
Port Arthur	124
Providence Bay	2
Rainy River	10
Richard's Landing	2
Sault Ste. Marie	55
Seguin Falls	1
Sioux Lookout	3
Smith's River	1
Spanish Mills	1
Spragg	1
Spring Bay	1
Sprucedale	2
Steelton	22
Sturgeon Falls	5
Sudbury	31
Sundridge	1
Thessalon	2
Trout Creek	2
Trout Mills	1

District No. 2.

Toronto	1,114

District No. 3.

Oakville	5
Port Credit	1
Toronto	970
Swansea	1

District No. 4.

Ayr	5
Acton	3
Alton	3
Aurora	8
Baden	6
Barrie	10
Beeton	3
Kitchener	111
Bloomingdale	1
Bolton	3
Bradford	2
Brampton	21
Breslau	1
Cargill	4
Chesley	12
Collingwood	9
Clarksburg	2
Conestoga	11
Cookstown	2
Elora	3
Elmira	5
Fergus	5
Formosa	3
Freelton	1
Floradale	2
Galt	68
Georgetown	15
German Mills	1
Glen Williams	2
Guelph	106
Hanover	10
Harriston	2
Heathcote	2
Hespeler	10
Huttonville	1
Kleinburg	1
Meaford	20
Midland	14
Mildmay	4
Milton	10
Mount Dennis	4
New Dundee	3
New Hamburg	6
Newmarket	4
Nobel	5
Norval	1
Orangeville	3
Orillia	1
Owen Sound	21
Parry Sound	18
Penetanguishene	22
Plattsville	3
Preston	29
St. Clements	3
St. Jacobs	2
Schomberg	2
Thornbury	2
Toronto	111
Tottenham	3
Walkerton	7
Waterloo	26
Wellesley	4
Weston	10
Woodbridge	1

District No. 5.

Alexandria	11
Almonte	10
Appleton	1
Apple Hill	2
Arnprior	13
Athens	3
Aultsville	22
Avonmore	3
Barry's Bay	2
Berwick	2
Billings Bridge	2
Blakeney	1
Bourget	2
Braeside	1
Brockville	38
Burritt's Rapids	2
Cardinal	9
Carleton Place	15
Casselman	4
Chesterville	4
Cobden	2
Cornwall	20
Crysler	3
Cummings Bridge	3
Douglas	2
Eastview	3
Eganville	5
Embrun	3
Finch	4
Gananoque	23
Golden Lake	1
Hawkesbury	12
Iroquois	6
Kemptville	4
Kenmore	2
Lanark	1
Lancaster	2
Leonard	1
L'Orignal	2
Lyndhurst	4
McCrimmon P.O.	1
Maxville	6
Merrickville	5
Mille Roches	3
Monklands	2
Morrisburg	6
Mountain	2
Newington	2
Northfield	1
Osnabruck	1
Ottawa	357
Pembroke	23
Perth	11
Plantagenet	3

TOWNS INSPECTED.—*Continued.*

Prescott	15
Renfrew	17
Rockland	5
Russell	3
Sand Point	1
Smith's Falls	13
Vankleek Hill	6
Vars	1
Vernon	1
Westboro	1
Westport	4
Whitney	1
Williamstown	2
Winchester	2
Woodruff	1

DISTRICT No. 6.

Aylmer	16
Beachville	2
Beamsville	3
Brantford	101
Bridgeburg	7
Dundas	22
Dunnville	10
Grimsby	8
Hagersville	3
Hamilton	456
Hickson	2
Humberson	3
Ingersoll	16
Jarvis	4
Langton	1
Merritton	16
Niagara Falls	46
Norwich	7
Paris	15
Port Colborne	6
Port Dalhousie	3
Port Dover	4
Port Robinson	2
Port Rowan	1
St. Catharines	65
St. George	4
Simcoe	21
Stevensville	5
Stony Creek	1
Tavistock	11
Tillsonburg	13
Thorold	16
Waterford	5
Welland	32
Woodstock	63
Combined Inspections	7

DISTRICT No. 7.

Ailsa Craig	3
Alvinston	5
Amherstburg	6
Arkona	4
Atwood	2
Auburn	1
Bayfield	1
Belle River	1
Blenheim	4
Blyth	15
Bothwell	5
Brigden	4
Brussells	7
Chatham	98
Clinton	24
Cottam	1
Crediton	2
Dashwood	7
Dresden	13
Dutton	2
Dublin	3
Embro	8
Essex	16
Exeter	1
Ford	2
Fordwich	16
Forest	6
Fullerton Corners	1
Glencoe	6
Goderich	39
Gorrie	2
Harrow	4
Hensall	7
Highgate	2
Kincardine	26
Kingsville	11
Leamington	12
Listowel	28
Lucan	8
Lucknow	14
London	302
Mitchell	18
Millbank	1
Milverton	6
Moncton	3
Mount Brydges	2
Parkhill	2
Petrolia	21
Point Edward	6
Port Stanley	2
Ridgetown	14
Rodney	3
St. Mary's	29
St. Thomas	95
Sandwich	1
Sarnia	58
Seaforth	22
Sebringville	2
Stratford	40
Strathroy	28
Thamesville	5
Tecumseh	1
Teeswater	13
Thedford	2
Thorndale	3
Tilbury	15
Walkerville	52
Wallaceburg	23
Walton	1
Watford	8
Wellesley	4
West Lorne	5
Windsor	105
Wingham	34
Wroxeter	4
Wyoming	6
Zurich	9

DISTRICT No. 8.

Actinolite	1
Allensville	2
Arden	1
Aspiden	3
Bancroft	8
Baptiste	1
Baysville	1
Belleville	25
Belleview	1
Birdsall	1
Birkendale	1
Blackwater Jct.	1
Bloomfield	1
Bowmanville	7
Bracebridge	25
Brickley	2
Bridgenorth	2
Broadbent	1
Burnt River	1
Campbellford	11
Camden East	1
Cannington	1
Centre Dummer	2
Coboconk	4
Cobourg	24
Colebrook	3
Coe Hill	6
Colborne	5
Corbyville	1
Cordova	1
Corson's Siding	1
Cookstown	1
Dartford	3
Delora	1
Deseronto	1
Dorset	1
Donald	1
Dwight	1
Egan Creek	1
Eldorado	3
Falkenburg	1
Faraday	2
Fenelon Falls	8
Flinton	1
Foxboro	1
Frankford	8
Gilmore	1
Glen Miller	3
Grassmere	1
Gravenhurst	14
Haliburton	5
Hastings	5
Havelock	4
Head Lake	1
Hekkla	1
Highland Grove	1
Hillside	2
Hogan	1
Huntsville	14
Indian River	2
Keeno	2
Kennaway	1
Kilworthy	1
Kinmount	3
Koshee	1

TOWNS INSPECTED.—*Continued.*

Lakefield	13
Lakeport	1
L'Amable	1
Leaside	1
Lang	2
Lindsay	31
Longford	2
Madoc	8
Malone	2
Maple Lake	2
Markham	5
Marmora	9
Martin's Siding	1
Maynooth	6
Midford	1
Milford	2
Millbridge	3
Miner's Bay	1
Monsell	1
Monteagle	1
Mount Albert	1
Mount Irwin	1
Musclow	1
Newburg	3
Newholm	1
Nipissing	3
Norland	1
Northport	1
Norwood	8
Orrville	2
Omemee	2
Oshawa	23
Parkersville	1
Peterborough	41
Picton	12
Point Ann	3
Port Hope	1
Port Sydney	4
Portage	1
Porterville	1
Powassan	9
Queensboro	2
Ravenscliffe	1
Ridge	1
St. Ola	1
Seguin Falls	3
Severn Bridge	3
Siloam	1
South River	5
Springbrook	1
Stouffville	8
Strathcona	1
Steenburg	1
Stirling	8
Sunderland	5
Tamworth	5
Toronto	232
Trenton	18
Trout Creek	5
Turriff	1
Turtle Creek	2
Tweed	12
Ullswater	1
Utterson	2
Uxbridge	8
Vankoughnet	1
Vansickle	1
Warkworth	2
Warsaw	1
Wellington	5
West Guilford	1
West Huntingdon	1
Westwood	3
Whitby	6
Yarker	3
Young's Point	2
Zephyr	2

DISTRICT NO. 9.

Alton	1
Allendale	9
Barrie	22
Belleville	43
Kitchener	23
Bracebridge	10
Brampton	25
Brockville	35
Brussells	15
Cardinal	1
Chesley	7
Clinton	15
Collingwood	30
Cornwall	27
Forest	9
Goderich	26
Guelph	75
Hanover	19
Kincardine	16
Kingston	64
Listowel	24
Meaford	22
Mitchell	19
Midland	16
Napanee	17
Orangeville	21
Orillia	24
Oshawa	14
Ottawa	77
Parkhill	10
Penetanguishene	20
Peterborough	50
Picton	17
Prescott	24
St. Mary's	31
Sarnia	16
Seaforth	15
Stouffville	6
Toronto	506
Trenton	57
Wiarton	10
Wingham	28

DISTRICT NO. 10.

Brantford	52
Dundas	6
Galt	28
Hamilton	25
London	53
St. Catharines	34
Toronto	1,589

ACCIDENTS REPORTED

1916

TABULATED BY INSPECTION DISTRICTS

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 1				
1	Oct. 15....	Algoma Steel Co.	Sault Ste. Marie	M	23	Toe bruised, nail off; billet dropped on foot while loading crane chain.
2	" 29....	" "	" " ..	M	47	Compound fracture of thumb; caught between chain and hook.
3	" 29....	" "	" " ..	M	24	Two fingers lacerated; piece of iron fell from buggy.
4	" 29....	" "	" " ..	M	21	Hot saw came down on foot; toes lacerated, one off.
5	" 29....	" "	" " ..	M	37	Palm and back of two fingers lacerated; hand on handle of barrow, struck column.
	" 27....	" "	" " ..	M	27	Finger lacerated; caught beween extensions while spotting rail box in boat.
7	" 27....	" "	" " ..	M	30	Two toes crushed; caught foot under bucket on floor.
8	" 27....	" "	" " ..	M	26	Finger lacerated; piece of pig iron fell.
9	" 23....	" "	" " ..	M	27	Rail slid down skids on to leg.
10	" 23...	" "	" " ..	M	21	Foot bruised; knocked casting over.
11	Sept. 13....	" "	" " ..	M	31	Hand burned; while tapping furnace, plug flew out.
12	Aug. 24....	" "	" " ..	M	27	Two toes crushed; car wheel being lifted by crane fell.
13	" 25...	" "	" " ..	M	19	End of finger crushed; by shell from straightening machine.
14	" 21....	" "	" " ..	M	20	Infected finger from slight scratch by chip of manganese.
16	Nov. 2....	" "	" " ..	M	25	Cut over eye; struck by cable.
17	Oct. 23....	" "	" " ..	M	46	Toe crushed; armature fell off bench, and end of shaft struck foot.
18	Nov. 15....	" "	" " ..	M	43	Fell between skids; lacerated knee, bruised hip, and burned both hands.
19						
24	" 15....	" "	" " ..	M	22	Cut on back of thigh; struck by hot bed buggy.
25	Oct. 29....	" "	" " ..	M	32	Struck on sore leg by bar while loading rails.
26	Sept. 3....	" "	" " ..	M	31	Foot bruised; skid rail turned over.
27	July 28....	" "	" " ..	M	43	Foot bruised; while loading billets, one dropped.
28	Nov. 15....	" "	" " ..	M	43	Outer surface of leg cut above knee; bar cobbled coming out of rolls and struck him.
	" 15....	" "	" " ..	M	22	Wrist burned by molten metal.
29	" 15....	" "	" " ..	M	29	Hand burned while handling shell rounds.
30	" 10....	" "	" " ..	M	46	Hand cut; handling piece of shell at cold saw.
32	Sept. 28....	" "	" " ..	M	23	Great toes crushed, another cut; caught in sprocket wheel of hoist.
33	Oct. 26.....	" "	" " ..	M	24	End of finger crushed while handling shell steel rods.

34	Nov.	3....	"	"	.....	"	"	..	M	29	Finger tip crushed, nail off; while holding bar other man missed bar.
35	"	3....	"	"	.....	"	"	..	M	28	Foot bruised; struck by billet.
36	"	3....	"	"	.....	"	"	..	M	27	Leg bruised; knocked down by crane.
37	Mar.	8....	"	"	.....	"	"	..	M	34	Hand crushed; while installing motor, top fell.
38	Nov.	7....	"	"	.....	"		..	M	31	Nose bruised and lacerated; struck by block of wood.
39	"	5....	"	"	.....	"	"	..	M	52	Jaw lacerated, otherwise badly bruised; cable of crane broke, blocks fell.
40	Oct.	30....	"	"	.....	"	"	..	M	22	Slight abscess, eyelid swollen; tapping furnace, speck of steel splashed into eye.
41	Nov.	16....	"	"	.....	"	"	..	M	18	Hand bruised; fell while carrying part of salamander cast iron.
42	"	15....	"	"	.....	"	"	..	M	30	Hand burned while putting chain on hot bar.
43	"	18....	"	"	.....	"	"	..	M	20	Hand burned while opening tap hole.
44	"	18....	"	"	.....	"	"	..	M	39	Back burned; slipped on platform of transfer table.
47	"	25....	"	"	.....	"	"	..	M	....	Arm fractured; caught between bar and roller.
50	"	17....	"	"	.....	"	"	..	M	47	Abrasion on shin; fell between two rails.
51	"	19....	"	"	.....	"		..	M	22	Back sprained; while stamping rounds.
52	"	20....	"	"	.....	"	"	..	M	31	Foot bruised; piece of shell steel fell.
53	"	19....	"	"	.....	"	"	..	M	24	Thumb cut; piece of flat iron fell.
54	"	20....	"	"	.....	"	"	..	M	49	Leg, shoulder and groin bruised; fell into gangway of engine cab.
55	"	10....	"	"	.....	"	"	..	M	21	Finger crushed; piece of slag fell on hand.
56	"	9....	"	"	.....	"	"	..	M	59	Finger lacerated; caught on nail.
57	"	28....	"	"	.....	"	"	..	M	40	Back of hand cut; struck by chisel.
58	"	28....	"	"	.....	"	"	..	M	25	Abdomen burned while pouring steel.
59	"	12....	"	"	.....	"	"	..	M	46	Knee bruised; knelt on piece of iron.
60	"	24....	"	"	.....	"	"	..	M	38	Face burned; working on top of oven.
61	"	24....	"	"	.....	"	"	..	M	22	Two fingers crushed at ends; caught between two shell rounds.
62	"	29....	"	"	.....	"	"	..	M	45	Arm bruised; caught between rail and drill press.
63	"	30....	"	"	.....	"	"	..	M	26	Ankle bruised; struck by piece of skull scrap.
64	Dec.	1....	"	"	.....	"	"	..	M	....	Ends of two fingers jammed; while hooking chain, crane-man lifted too quickly.
67	"	2....	"	"	.....	"	"	..	M	39	Toe bruised; steel pipe fell on foot.
68	"	2....	"	"	.....	"	"	..	M	38	Fell off scaffold and struck side on wheel; short circuit on line caused explosion.
69	"	2....	"	"	.....	"	"	..	M	27	Scalp cut; poker fell from wall.
70	"	2....	"	"	.....	"	"	..	M	48	Finger end crushed; crane chain caught hand.
71	"	5....	"	"	.....	"	"	..	M	19	Fell and broke leg.
72	"	7....	"	"	.....	"	"	..	M	36	Palm of hand cut on sharp edge of splice bar.
73	"	10....	"	"	.....	"	"	..	M	21	Foot bruised; piece of iron fell on it.
74	"	10....	"	"	.....	"	"	..	M	16	Little finger off in chain above a shieve.
79	"	14....	"	"	.....	"	"	..	M	....	Foot bruised; billet rolled on it.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 1—Continued				
82	Dec. 16....	Algoma Steel Co.	Sault Ste. Marie.	M	35	Scalded leg while thawing out gravel.
83	" 18....	" "	" " ..	M	42	Finger end crushed; disconnecting engine.
84	" 18....	" "	" " ..	M	18	Thumb cut on circular saw.
85	" 12....	" "	" " ..	M	44	Finger end crushed; between hooks and carriage.
86	Nov. 6....	" "	" " ..	M	31	Burns on arm from shell round off hot bed.
87	Dec. 30....	" "	" " ..	M	45	Got cement in eye while working around concrete mixer.
88	" 28....	" "	" " ..	M	39	Leg and hands injured; while passing brick, caught between box and bar on charging crane.
89	" 27....	" "	" " ..	M	57	Foot bruised by flange plate slipping.
90	Jan. 10....	" "	" " ..	M	21	Compound fracture of leg; caught between trolley and girder.
91	" 13....	" "	" " ..	M	....	Deep lacerations of muscles and flesh on upper back over spine; fell backwards on exposed gears.
93	" 1....	" "	" " ..	M	46	Finger lacerated; caught on handle of wheel barrow.
94	" 1....	" "	" " ..	M	36	Hand smashed; while working at reheating furnace door fell.
95	Dec. 29....	" "	" " ..	M	26	Ankle sprained; jumped from delivery waggon.
96	Jan. 3....	" "	" " ..	M	26	Chin cut and teeth broken; turning billets, bar sprung back.
97	Dec. 13....	" "	" " ..	M	29	Neck burned; hot material fell from furnace.
98	" 15....	" "	" " ..	M	33	Thumb cut; caught between punch head and rail.
104	Nov. 18....	" "	" " ..	M	47	Right great toe crushed; turning rails.
105	Jan. 7....	" "	" " ..	M	22	Finger cut on sharp burr of shell round.
106	" 7....	" "	" " ..	M	27	Hand burned by hot metal.
107	" 11....	" "	" " ..	M	29	Face burned; struck by red hot hook.
108	" 9....	" "	" " ..	M	33	Hand cut; while loading rails, caught between car and rail.
109	" 10...	" "	" " ..	M	20	Hip bruised; cable slings slipped on crane and released bar which fell on hips.
110	" 7....	" "	" " ..	M	20	End of finger off at distal joint and other finger cut; crushed between two shell steel rounds.
111	" 6....	" "	" " ..	M	25	Hand bruised; caught between furnace pusher and bar.
112	" 11...	" "	" " ..	M	22	Two toes jammed; piece of shell round fell.
113	Oct. 30, 15..	" "	" " ..	M	30	Eyes burned; while fixing tap hole on furnace, metal flew out.
114	Jan. 14....	" "	" " ..	M	26	Foot cut; while handling splice bars, one fell.
115	" 13....	" "	" " ..	M	37	Hips bruised; caught between cars.

116	"	14....	"	"	.....	"	"	..	M	44	Foot bruised; straightening shell round and bar slipped.
117	"	13....	"	"	.....	"	"	..	M	36	Finger end lacerated while lifting test piece of shell rounds.
118	"	13....	"	"	.....	"	"	..	M	51	Broke knee cap; slipped on rail.
119	"	16....	"	"	.....	"	"	..	M	23	Foreign matter in eye.
120	"	17....	"	"	.....	"	"	..	M	23	Thumb bruised; while turning coke grinder caught between guide and buckstay.
121	"	17....	"	"	.....	"	"	..	M	20	Foot bruised; unloading shell steel.
122	"	15...	"	"	.....	"	"	..	M	38	Foot burned; stepped on hot slag.
123	"	17....	"	"	.....	"	"	..	M	35	Hand bruised; buggy tipped up.
124	"	20....	"	"	.....	"	"	..	M	27	Forearm cut on billet.
125	"	20....	"	"	.....	"	"	..	M	32	Nail off finger; piece of scrap fell.
158	Feb.	13....	"	"	.....	"	"	..	M	21	Wrist dislocated, body bruised, and face cut; crane scantling broke and he fell.
159	"	12....	"	"	.....	"	"	..	M	22	Toe crushed; shell round fell on foot.
160	"	12....	"	"	.....	"	"	..	M	32	Thigh bruised; shell round fell on it.
161	"	10....	"	"	.....	"	"	..	M	28	Thumb broken and lacerated; striker missed bar.
162	"	15....	"	"	.....	"	"	..	M	45	Hand badly cut in circular saw.
163	"	15....	"	"	.....	"	"	..	M	30	Nail off thumb; reaching for chain to dump bucket, bail fell over.
164	"	17....	"	"	.....	"	"	..	M	40	Leg broken; fell over spur on open hearth floor.
165	"	24....	"	"	.....	"	"	..	M	42	Leg broken; caught in slide of ore from ore pile.
166	"	19....	"	"	.....	"	"	..	M	45	Instep bruised; hammer head flew off.
167	"	18....	"	"	.....	"	"	..	M	19	Got foreign matter in eye while crossing yard.
172	"	14....	"	"	.....	"	"	..	M	22	Knee bruised; motor rolled over.
173	"	23....	"	"	.....	"	"	..	M	48	Cornea injured; breaking coal on hopper, chip flew into eye.
174	"	23....	"	"	.....	"	"	..	M	20	Wrist burned; feeding pipe through loop hole in furnace, draught caused flame to shoot out.
175	"	28....	"	"	.....	"	"	..	M	38	Finger end crushed; piece of shell fell.
176	"	16....	"	"	.....	"	"	..	M	46	Leg burned.
177	Jan.	26....	"	"	.....	"	"	..	M	65	Great toe crushed; piece of shell steel fell.
178	Nov.	29, '15	"	"	.....	"	"	..	M	35	Hand bruised; unloading ties, one fell.
179	Feb.	28....	"	"	.....	"	"	..	M	18	Two fingers lacerated; handling shell rounds, caught hand between two.
180	Mar.	3....	"	"	.....	"	"	..	M	36	Foot bruised; handling test pieces, one fell.
181	"	4....	"	"	.....	"	"	..	M	37	Foot bruised; dumping load of shear butts, one fell.
182	"	2....	"	"	.....	"	"	..	M	40	Wrist sprained; caught arm between car and bucket.
183	"	4....	"	"	.....	"	"	..	M	18	Thumb off; caught in gears.
184	"	2....	"	"	.....	"	"	..	M	25	Slight cut on hand; wrench slipped while tightening nut on finishing roll.
185	"	1....	"	"	.....	"	"	..	M	25	Jaw badly bruised, injuries around chest, drilling holes through iron, travelling crane caught clothing, rolled against truss.
186	"	2....	"	"	.....	"	"	..	M	35	Face and hand burned; struck live wire.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 1—Continued				
187	Feb. 24....	Algoma Steel Co.	Sault Ste. Marie.	M	43	Eyes injured by dust or peat while shovelling burnt dolomite.
188	Mar. 1....	" "	" " ..	M	38	Back injured; fell from hydraulic pipe.
189	Feb. 29....	" "	" " ..	M	34	Great toe bruised; unloading ties, one fell.
190	Mar. 7....	" "	" " ..	M	28	Finger end crushed; between ore and car.
193	" 12....	" "	" " ..	M	42	Face burned.
194	" 13....	" "	" " ..	M	32	End of thumb crushed between salamander and building.
195	" 15....	" "	" " ..	M	34	Forehead cut; ran up against corrugated iron.
196	" 15....	" "	" " ..	M	26	Great toe crushed; stepped between charging cars to signal overhead cars.
197	" 15....	" "	" " ..	M	53	Back of hand lacerated; caught in belt while greasing pulley.
198	" 14....	" "	" " ..	M	35	Side wrenched; fell while carrying billet.
199	" 10....	" "	" " ..	M	22	Knee bruised; coupling cars.
200	" 11....	" "	" " ..	M	22	Piece of babbitt got into eye.
201	" 11....	" "	" " ..	M	25	Hand burned; putting lamp in socket, wire broke, and live wire caught hand.
202	" 10....	" "	" " ..	M	40	Opacities on cornea; unloading dirt, foreign matter in eye.
203	" 12....	" "	" " ..	M	48	Wrist sprained; slipped on ties, walking on track.
204	" 9....	" "	" " ..	M	27	Finger cut; pushing in door with bar, same slipped and caught finger.
205	" 4....	" "	" " ..	M	30	Right testicle bruised; turning billet, wrench slipped.
206	" 18....	" "	" " ..	M	25	Foot cut; while turning over billet.
207	" 21....	" "	" " ..	M	36	Side of head bruised; concussion of brain. Struck on head with sledge hammer, while cutting off rivets on car.
208	" 21....	" "	" " ..	M	23	Ankle bruised; putting chains on shell rounds, caught ankle on straight edge.
209	" 22....	" "	" " ..	M	20	Finger cut; unloading stone for dolomite cupola.
210	" 19....	" "	" " ..	M	17	End of thumb crushed; pushing billet in shears, caught between billet and guard.
211	" 18....	" "	" " ..	M	28	Face and wrist burned; lighting gas in ladle.
212	" 18....	" "	" " ..	M	40	Two fingers cut; grinding latch for hydraulic valve.
213	" 17....	" "	" " ..	M	45	Finger crushed while piling rails.
220	" 24....	" "	" " ..	M	19	Two fingers jammed; loading sheared rails in stock boxes.
221	" 25....	" "	" " ..	M	44	Two toes bruised; trimming pig iron and dropped piece.

222	" 28....	"	"	.....	"	"	..	M	22	Thigh bruised; pulling test from hot saw, tongs slipped and he fell into hole.
223	" 28....	"	"	.....	"	"	..	M	35	Foot bruised; handling shell tests, one fell.
224	April 6....	"	"	.....	"	"	..	M	31	End of finger crushed, caught between two shear butts.
225	" 8....	"	"	.....	"	"	..	M	21	Finger cut; on sharp edge of shell steel while working on cold saw.
226	" 7....	"	"	.....	"	"	..	M	52	Thumb crushed and broken; wiping feed pump and caught in rocker arm.
227	" 6....	"	"	.....	"	"	..	M	24	End of finger off; caught finger between engine and stool.
228	" 7....	"	"	.....	"	"	..	M	23	Foot sprained; caught between roll and guide while stepping over roll runaway.
229	" 2....	"	"	.....	"	"	..	M	19	Nail off thumb; turning over billet.
230	" 3....	"	"	.....	"	"	..	M	29	Ankle bruised; lifting piece of skull, chain slipped and jammed foot.
231	" 9....	"	"	.....	"	"	..	M	25	Ran nail in sole of foot; stepped on board with nail sticking through it.
232	" 8....	"	"	.....	"	"	..	M	59	Finger cut (slightly infected), while making stoppers.
233	" 5....	"	"	.....	"	"	..	M	38	End of finger jammed; pushing bar into straightening press, caught between bar and roller.
234	" 7....	"	"	.....	"	"	..	M	27	Face burned with acid.
235	" 7....	"	"	.....	"	"	..	M	65	Scalp and left leg cut; standing on beds, slipped and fell on rail.
236	" 12....	"	"	.....	"	"	..	M	25	Burned neck by flash from Bessemer converter.
237	" 11....	"	"	.....	"	"	..	M	42	Ankle sprained; casting rolled down.
238	" 12....	"	"	.....	"	"	..	M	43	Ran nail in sole of foot while loading lumber in car.
239	" 6....	"	"	.....	"	"	..	M	21	Piece of steel or emery flew in eye while grinding.
214	Mar. 19....	"	"	.....	"	"	..	M	36	Foot burned on stand pipe.
215	" 21....	"	"	.....	"	"	..	M	34	Abrasion on thigh; cleaning high line, stepped down between two planks.
217	" 24....	"	"	.....	"	"	..	M	46	Finger end crushed; caught between two rail tests.
218	" 25....	"	"	.....	"	"	..	M	18	Palm of hand badly lacerated; caught in lathe.
219	" 23....	"	"	.....	"	"	..	M	24	Face and arm burned; while taking out tapping hole, heat blew out.
126	Jan. 29....	"	"	.....	"	"	..	M	25	*Crushed to death; caught by crane between crane truck and girders.
127	" 22....	"	"	.....	"	"	..	M	34	Piece of steel in eye.
128	" 24....	"	"	.....	"	"	..	M	31	Scalp cut, leg sprained; fell between roasters.
129	" 21....	"	"	.....	"	"	..	M	35	Punctured wound in hand; sliver from plate penetrated palm.
132	Feb. 10....	"	"	.....	"	"	..	M	20	Concussion of the brain; hoisting line broke, girder fell with him.
133	" 2....	"	"	.....	"	"	..	M	....	Cheek bruised with slight abrasion; struck by board.
134	" 2....	"	"	.....	"	"	..	M	23	Side of face burned while opening tap hole.
135	" 4....	"	"	.....	"	"	..	M	24	Finger cut; caught between bar and rail.
136	" 3....	"	"	.....	"	"	..	M	32	Finger cut; in gears on coke conveyor.

*Fatal.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 1—Continued				
137	Feb. 3....	Algoma Steel Co.	Sault Ste. Marie.	M	40	Foot bruised; pulled buggy over it.
138	" 2....	" "	" " ..	M	21	Skin on two toes lacerated; lump of ore fell.
139	Jan. 22....	" "	" " ..	M	38	Face and hands burned by gas explosion.
140	" 29....	" "	" " ..	M	48	Palm of hand cut on hopper door lever.
141	" 23....	" "	" " ..	M	22	Piece of shell fell on foot and bruised it.
142	" 31....	" "	" " ..	M	22	Finger crushed between two shell rounds.
143	" 31....	" "	" " ..	M	28	End of finger off; rail canted over.
144	" 31....	" "	" " ..	M	44	Three fingers cut; while pulling work off bolt, it dropped on hand.
145	" 30....	" "	" " ..	M	25	Two fingers cut; rail fell off pile.
146	" 26....	" "	" " ..	M	26	Thumb lacerated; rail fell from pile.
147	" 20....	" "	" " ..	M	33	Ankle swollen; slipped, struck sharp edge of step.
148	Feb. 5....	" "	" " ..	M	25	Arm sprained; struck by skip while cleaning out pit.
149	" 5....	" "	" " ..	M	18	Shoulder bruised between wall and dinkey.
150	" 8....	" "	" " ..	M	24	Back bruised; fell under side of car.
151	" 4....	" "	" " ..	M	31	Back sprained; moving heavy casting.
152	" 5....	" "	" " ..	M	21	Finger end off; caught between rail and skid.
153	Jan. 2....	" "	" " ..	M	20	Cut over eye by hook hanging from crane.
154	Feb. 14....	" "	" " ..	M	25	Thumb caught between crane chains and shell steel.
155	" 12....	" "	" " ..	M	35	Pipe fell on nose and bruised bridge.
156	" 12....	" "	" " ..	M	40	Finger cut on ash bucket.
157	" 6....	" "	" " ..	M	43	Foreign substance in eye while chipping shell rounds.
240	April 2....	" "	" " ..	M	27	Ankle sprained; caught foot under foot board of engine.
243	Mar. 14....	" "	" " ..	M	44	Foot bruised; rod slipped out of hand.
244	April 8....	" "	" " ..	M	32	Finger cut uncoupling cars.
245	" 15....	" "	" " ..	M	48	Foot bruised; steel bar fell.
246	" 19....	" "	" " ..	M	21	End of finger crushed; lump of ore rolled from charging boxes.
247	" 16....	" "	" " ..	M	35	Back of hand lacerated; bar of shell steel dropped.
248	" 19....	" "	" " ..	M	33	Burn on arm (slightly infected); while hoisting hot skulls.
249	" 15....	" "	" " ..	M	44	Foot bruised; bar of shell steel fell.
250	" 2....	" "	" " ..	M	34	Eye inflamed; foreign matter in eye.
251	" 19....	" "	" " ..	M	25	Wrist burned while fixing cinder notch.
252	" 6....	" "	" " ..	M	19	Leg burned by a steam valve.
253	" 25....	" "	" " ..	M	40	Forehead cut; struck by bar.
254	" 18....	" "	" " ..	M	23	Ankles burned; while pricking ladle open, metal splashed out.

255	"	25....	"	"	.....	"	"	..	M	20	Foot bruised; tripped over handle of grout box.
256	"	24....	"	"	.....	"	"	..	M	40	Side of back bruised; against piece of iron.
257	"	24....	"	"	.....	"	"	..	M	40	Leg bruised; crushed between ladle car and ladle.
258	"	22....	"	"	.....	"	"	..	M	32	Hand bruised; jammed by rail.
259	"	15....	"	"	.....	"	"	..	M	36	Knee bruised; slipped and fell on rail.
265	"	4....	"	"	.....	"	"	..	M	23	Eye inflamed; piece of steel flew while chipping a billet.
266	May	1....	"		.....	"	"	..	M	43	Calf, wrists and back burned; metal splashed.
267	April	29....	"	"	.....	"	"	..	M	29	Rib broken; fell on corner of tool box.
268	"	23....	"	"	.....	"	"	..	M	20	Foot bruised; shell round dropped.
269	"	28....	"	"	.....	"	"	..	M	24	Thumb lacerated; bars swung and caught thumb.
270	"	21....	"	"	.....	"	"	..	M	23	Ankle burned; opening tap hole in furnace.
271	"	20....	"	"	.....	"	"	..	M	21	End of thumb crushed while storing salamander.
272	"	21....	"	"	.....	"	"	..	M	30	Leg broken; buggy tipped over on foot.
273	"	24....	"	"	.....	"	"	..	M	20	Wrist burned.
274	May	3....	"	"	.....	"	"	..	M	36	Scalp cut, burns and abrasion on side of neck; hot scrap fell from crane.
275	"	4....	"	"	.....	"	"	..	M	47	Wrist sprained; caught between mud buggy and back stay on oven.
276	"	4....	"	"	.....	"	"	..	M	31	Face and arms burned; while opening tap hole of furnace, rush of molten metal caught him.
285	"	10....	"	"	.....	"	"	..	M	55	Two fingers lacerated; lump of ore fell.
286	"	11....	"	"	.....	"	"	..	M	36	Nail off finger; jammed on rim of ladle.
287	"	5....	"	"	.....	"	"	..	M	39	Abscesses on fingers from continual use of tongs.
288	"	9....	"	"	.....	"	"	..	M	34	Great toe bruised; rail fell.
289	"	9....	"	"	.....	"	"	..	M	40	Two fingers crushed between roller and bar of straightening press.
290	"	2....	"	"	.....	"	"	..	M	22	End of finger crushed; piece of scrap fell.
291	"	6....	"	"	.....	"	"	..	M	47	Back sprained; pulling rail out of drilling machine.
292	"	9....	"	"	.....	"	"	..	M	27	Body burned and head cut; metal splashed over side of ladle.
293	"	9....	"	"	.....	"	"	..	M	22	Burns on face and ankle, cut on head; metal splashed over side of ladle.
294	April	11....	"	"	.....	"	"	..	M	30	Chin burned; splash of hot metal.
295	May	12....	"	"	.....	"	"	..	M	28	Nail ran into sole of foot.
296	"	3....	"	"	.....	"	"	..	M	28	Foot burned by hot steel scrap.
297	"	2....	"	"	.....	"	"	..	M	33	Side of chest bruised; piece of cinder fell.
298	"	11....	"	"	.....	"	"	..	M	32	Foot bruised; fell while carrying beam.
299	"	13....	"	"	.....	"	"	..	M	23	Two toes crushed; shell fell from bench onto foot.
300	"	4....	"	"	.....	"	"	..	M	39	Thumb sprained; while gagging rail, gag turned over.
301	"	18....	"	"	.....	"	"	..	M	40	Face burned by hot water and steam while disconnecting water pipe.
302	"	16....	"	"	.....	"	"	..	M	33	End of finger crushed; caught in gas producer lever when bell dropped off.
303	"	17....	"	"	.....	"	"	..	M	60	Foreign matter in eye; unloading car of dirt.
304	"	15....	"	"	.....	"	"	..	M	....	Finger cut; caught between rails.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 1—Continued				
320	May 22....	Algoma Steel Co.	Sault Ste. Marie.	M	22	Side bruised when door of car fell.
321	" 22....	" "	" " ..	M	27	Forehead and nose cut; ran against crane.
322	" 20....	" "	" " ..	M	22	Palm lacerated; slipped against pile of billets.
323	" 21....	" "	" " ..	M	28	Finger lacerated; slipped on saw.
324	" 21....	" "	" " ..	M	24	Foot bruised; rail fell on foot.
325	" 17....	" "	" " ..	M	....	Toe crushed; caught foot under buggy track.
340	" 31....	" "	" " ..	M	28	Finger jammed; pushing wheelbarrow, caught finger between barrow and wall.
341	June 4....	" "	" " ..	M	20	Finger cut; piece of dolomite rolled over, when dumping charging buggy.
342	" 4....	" "	" " ..	M	56	Hand burned by extension light.
343	May 29....	" "	" " ..	M	27	Palm cut; holding piece of steel under hammer, broke in his hand.
344	" 31....	" "	" " ..	M	27	Scalp cut; setting gauge on billet shears, slipped off runaway.
345	" 29....	" "	" " ..	M	47	Hand sprained; tripped over sewer wire.
346	" 22....	" "	" " ..	M	51	Chest bruised; tightening bolt on saw, wrench slipped, and he fell.
347	" 26....	" "	" " ..	M	37	Finger lacerated; ratchet fell on hand.
348	" 25....	" "	" " ..	M	24	Ankle sprained; getting off footboard of engine.
349	" 25....	" "	" " ..	M	27	Portion of finger off; caught between hook and bucket of crane.
350	" 23....	" "	" " ..	M	27	Chest bruised while loading scrap iron onto cupola hoist.
351	" 25....	" "	" " ..	M	37	Knee bruised; struck when climbing over rails.
352	" 27....	" "	" " ..	M	21	Foot burned; while banking ingots, one rolled over onto foot.
353	" 26....	" "	" " ..	M	28	Two fingers cut; caught between beam and waggon.
358	June 10....	" "	" " ..	M	21	Neck, face, arms and leg burned by molten slag.
359	" 10....	" "	" " ..	M	33	Badly burned by molten slag.
360	" 10....	" "	" " ..	M	21	Badly burned by molten slag.
361	" 10....	" "	" " ..	M	35	Severely burned by molten slag.
362	May 26....	" "	" " ..	M	24	Ankle and heel bruised by rail.
363	June 7....	" "	" " ..	M	35	Wrist sprained, face cut; fell from platform to scrap car.
364	" 6....	" "	" " ..	M	51	Wrist bruised by drift pin when bucking up rivets.
365	" 5....	" "	" " ..	M	33	Finger end crushed between cable and hook when switching car.

366	"	5....	"	"	.....	"	"	..	M	20	Hand crushed; while taking tie plate out of steam hammer, die came down.
367	"	5....	"	"	.....	"	"	..	M	30	Foot cut; test piece fell.
368	May	28....	"	"	.....	"	"	..	M	32	Cheek cut; crane swung round and struck him.
369	June	8....	"	"	.....	"	"	..	M	54	Hand jammed while loading timber.
370	"	10....	"	"	.....	"	"	..	M	36	Rash on face and thigh from heat.
371	"	9....	"	"	.....	"	"	..	M	42	Hip bruised; caught sleeve on nail and fell.
372	"	9....	"	"	.....	"	"	..	M	24	Finger end crushed while throwing switch at coke pile.
373	"	9....	"	"	.....	"	"	..	M	18	Thumb crushed in gear.
374	"	8....	"	"	.....	"	"	..	M	53	Finger end crushed; between roller and rail.
375	"	11....	"	"	.....	"	"	..	M	26	Toe jammed; while prying shaft, pry broke and shaft fell.
376	"	10 ...	"	"	.....	"	"	..	M	46	Back sprained; lifting rails.
377	May	26....	"	"	.....	"	"	..	M	31	Heel burned by hot metal which blew through stopper hole.
378	June	12....	"	"	.....	"	"	..	M	23	Foot bruised; rail fell.
379	"	12....	"	"	.....	"	"	..	M	31	Finger cut on hot saw.
380	April	30....	"	"	.....	"	"	..	M	26	Toe bruised; shear butt fell from table.
381	June	11....	"	"	.....	"	"	..	M	28	Fingers lacerated; while hooking chain on steel ladle.
382	"	14....	"	"	.....	"	"	..	M	36	Toes crushed; while opening up a chilled heat, bleeding rod fell on foot.
397	April	24....	"	"	.....	"	"	..	M	19	Side of face burned; fell on hot shell round.
398	June	14....	"	"	.....	"	"	..	M	28	Shoulder bruised; struck by piece of coal from roof.
399	"	18....	"	"	.....	"	"	..	M	26	Ear and side of face burned; while working at gas main opening joint, gas caught fire.
400	"	18....	"	"	.....	"	"	..	M	24	Face and hands burned; while opening joint in gas main, gas caught fire.
401	"	18....	"	"	.....	"	"	..	M	47	Plate dropped on toe and bruised it.
402	"	18....	"	"	.....	"	"	..	M	49	Hand bruised; lift came down while hand was on shell rounds.
403	"	16....	"	"	.....	"	"	..	M	35	Foot bruised; bar rolled on it.
404	"	19....	"	"	.....	"	"	..	M	21	Burns over entire face; digging out tap hole.
405	"	15....	"	"	.....	"	"	..	M	38	Two fingers bruised; bar fell on hand.
415	"	25....	"	"	.....	"	"	..	M	42	Scalp cut; brick fell.
416	"	28....	"	"	.....	"	"	..	M	38	Arm cut; piece of iron fell.
417	"	26....	"	"	.....	"	"	..	M	22	Ankle bruised; brick fell.
418	"	26....	"	"	.....	"	"	..	M	20	Compound comminuted fracture of leg; fell and car ran over leg.
419	"	20....	"	"	.....	"	"	..	M	27	Two ribs broken; fell onto runway.
420	"	23....	"	"	.....	"	"	..	M	25	Three fingers bruised, probable loss of one; while pushing bar into press, caught fingers.
421	"	24...	"	"	.....	"	"	..	M	28	Knife slipped while cutting piece off belt and ran into thigh.
422	"	22....	"	"	.....	"	"	..	M	42	Ankle sprained; while hooking into piece of scrap.
423	"	19....	"	"	.....	"	"	..	M	37	Ran piece of wire into finger while taking wire cable off.
424	"	17....	"	"	.....	"	"	..	M	45	Punctured wounds; billet fell on thigh.
425	"	26....	"	"	.....	"	"	..	M	32	Back sprained lifting sheave block.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 1—Continued				
426	June 28....	Algoma Steel Co.	Sault Ste. Marie.	M	35	Leg caught between car and engine, bruising it.
427	" 25....	" "	" " ..	M	21	Foot bruised and sprained; crane cable broke allowing rails to slide.
428	" 26....	" "	" " ..	M	35	Inner side of arm cut; caught by hook.
429	" 22....	" "	" " ..	M	35	Back sprained while lifting scrap.
430	" 20....	" "	" " ..	M	28	Abscess; caught hand between wrench and rail.
431	" 23....	" "	" " ..	M	33	Finger caught while jacking up vessel, nail off.
432	" 22....	" "	" " ..	M	28	Leg burned by piece of hot scrap.
433	" 24....	" "	" " ..	M	21	Eyeball cut, hemorrhage; piece of slag flew off bar.
435	" 22....	" "	" " ..	M	37	Foot jammed between shell rounds.
436	" 21....	" "	" " ..	M	30	Chest bruised; guide flew out from rolls.
437	" 26....	" "	" " ..	M	39	While shearing flats machine came down and cut finger.
438	" 26....	" "	" " ..	M	36	Ankle sprained and lacerated; piece of concrete fell on leg.
439	July 12....	" "	" " ..	M	34	Severe cut; carpenter's axe slipped from plank and fell on him.
440	June 7....	" "	" " ..	M	....	Two fingers crushed; caught in gear.
441	" 30....	" "	" " ..	M	19	Fell and bruised elbow.
442	July 3....	" "	" " ..	M	28	Cut over eye; sledger missed bar.
443	June 23....	" "	" " ..	M	24	Eye inflamed; got foreign matter in it.
444	July 7....	" "	" " ..	M	25	Bruise on palm; caught on top of car.
445	" 9....	" "	" " ..	M	27	Finger cut; piece of ore slipped.
446	" 8....	" "	" " ..	M	43	Knee joint bruised; fell off gang plank with barrow.
447	" 7....	" "	" " ..	M	24	Struck leg with adze.
448	" 8....	" "	" " ..	M	29	Thumb cut at base; sheet of iron fell.
449	" 8....	" "	" " ..	M	28	Finger cut; caught between two shell rounds.
450	" 7....	" "	" " ..	M	....	Piece flew off skull and caught injured over the eye.
451	May 27....	" "	" " ..	M	35	Rail fell on toe and crushed it.
452	July 12....	" "	" " ..	M	48	Leg burned; hot water splashed from tank.
453	" 13....	" "	" " ..	M	38	Toe crushed; angle bar gave way allowing diamond crossing to fall.
454	" 15....	" "	" " ..	M	39	Face burned; gas came out of gas producer when door was opened.
455	" 13....	" "	" " ..	M	30	Finger cut; shell blank rolled from table.
463	" 19....	" "	" " ..	M	35	Hand burned on hot bar.
464	" 20....	" "	" " ..	M	27	Finger cut; while removing shell blank, saw struck blank and flung it around.
465	July 22....	" "	" " ..	M	17	Ankle sprained; while filing rails, slipped off boards.

466	" 3....	"	"	.....	"	"	..	M	31	Injury to cornea of both eyes.
477	" 30....	"	"	.....	"	"	..	M	23	Face and hands burned by hot water.
482	" 23....	"	"	.....	"	"	..	M	35	Tip of finger off; caught between roller and frame of press.
483	" 21....	"	"	.....	"	"	..	M	18	Foot cut; shell test fell off water tank.
484	" 24....	"	"	.....	"	"	..	M	35	Wrist sprained while changing hook of crane.
485	Aug. 27....	"	"	.....	"	"	..	M	22	Hand burned; while putting a 104 volt lamp in a 250 line, lamp exploded.
488	July 27....	"	"	.....	"	"	..	M	22	Hand cut; struck on corner of rail.
489	" 28....	"	"	.....	"	"	..	M	22	Bruise; struck foot against a piece of steel.
490	" 31....	"	"	.....	"	"	..	M	31	Shoulder bruised; bloom struck crow bar he was using.
491	" 22....	"	"	.....	"	"	..	M	30	Shoulder burned; came in contact with shear butt car.
492	" 26....	"	"	.....	"	"	..	M	20	Thumb cut while pulling up bars.
493	" 31....	"	"	.....	"	"	..	M	30	Burns on forearms; while pricking stopper on ladle, steel shot out and splashed.
494	" 29....		"	.....	"	"	..	M	36	Face and arms burned by hot air.
495	" 26....	"	"	.....	"	"	..	M	....	Cut on eye; piece of coal flew up.
496	" 24....	"	"	.....	"	"	..	M	....	Got steel dust in eye causing inflammation.
497	" 28....	"	"	.....	"	"	..	M	55	Dropped piece of casting on foot and bruised it.
498	Aug. 4....	"	"	.....	"	"	..	M	17	Billet fell on hand and cut finger.
502	July 29....	"	"	.....	"	"	..	M	....	Burns on left side; molten metal splashed.
503	Aug. 5....	"	"	.....	"	"	..	M	20	Concussion of left lung; rolling shell steel bars, fell across rail of bed.
504	" 4....	"	"	.....	"	"	..	M	29	Left arm cut; fell on piece of iron.
505	" 7....	"	"	.....	"	"	..	M	21	Hand and wrist burned, also finger and base of thumb of other hand; screwing electric globe into socket, it burst.
506	" 7....	"	"	.....	"	"	..	M	29	Great toe jammed while loading rails in boat.
507	" 1....	"	"	.....	"	"	..	M	32	Thumb infected; handling cable, scratched hand on loose strand of wire.
508	July 24....	"	"	.....	"	"	..	M	28	Hand burned; helping to change hot saw, caught hand on roll.
510	Aug. 15....	"	"	.....	"	"	..	M	44	Face burned; while operating crane, sparks flew from dinkey locomotive.
511	" 14....	"	"	.....	"	"	..	M	48	End of finger crushed; fixing liner under rest bar when bar slipped.
512	July 30....	"	"	.....	"	"	..	M	50	Abscess on finger, a shell rolled jamming finger against catching block.
513	Aug. 11....	"	"	.....	"	"	..	M	17	Finger bruised, nail off; pushing bars into straightening press, caught between roller and bar.
514	" 11....	"	"	.....	"	"	..	M	30	Head cut; a lump of ore fell from bucket.
515	" 1....	"	"	.....	"	"	..	M	26	Finger jammed, nail off; caught in switch while throwing it.
516	" 13....	"	"	.....	"	"	..	M	30	Thumb jammed; caught between cable and hook when looking into chute.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 1—Continued				
517	Aug. 14....	Algoma Steel Co.	Sault Ste. Marie	M	45	Burns on right foot; pouring a box and it ran out onto foot.
518	" 30....	" "	" " ..	M	26	Hand amputated above wrist; caught between couplings when coupling cars.
519	" 27....	" "	" " ..	M	31	Eye cut; hemorrhage of anterior chamber; holding cold set on nut. When struck by sledge piece of nut flew off.
523	" 20....	" "	" " ..	M	21	Electric burns; repairing lights and short circuited the fuse block.
524	" 21....	" "	" " ..	M	34	Bone broken and abrasion of great toe; shell over balanced and rolled off bench.
525	" 17....	" "	" " ..	M	25	Burn on forearm; caught on hot bar while taking out chute.
526	" 19....	" "	" " ..	M	34	Forehead cut; passing under ladle as lever was being removed, lever dropped.
527	" 19....	" "	" " ..	M	32	End of finger jammed, nail off; taking tubes out of boiler.
528	" 17....	" "	" " ..	M	51	Great toe bruised; let splice bar fall.
529	" 18....	" "	" " ..	M	36	Burn on right buttock; putting lids on oven, pants caught fire.
530	Sept. 2....	" "	" " ..	M	21	*Drowned in sewer hole; over balanced and struck head in descent.
531	Aug. 23....	" "	" " ..	M	50	Wrist sprained; machine started, taking glove through with bar.
532	" 23....	" "	" " ..	M	33	Elbow bruised; caught by moving crane.
533	" 23....	" "	" " ..	M	36	Finger jammed, nail off; while taking hook off ladle, caught finger between chain and hook.
534	" 21....	" "	" " ..	M	25	Thumb jammed, nail off, while taking a cap off trolley.
535	June 13...	" "	" " ..	M	40	End of finger crushed; rail rolled on finger.
548	Aug. 29....	" "	" " ..	M	25	Great toe crushed, nail off; bar broke through plank and fell.
551	" 28....	" "	" " ..	M	18	Hand cut on piece of steel; infected.
552	Sept. 3....	" "	" " ..	M	31	Knee bruised; fell while unloading speigel.
553	Aug. 28....	" "	" " ..	M	39	Punctured wound on hand by ragged edge of shell.
554	" 30....	" "	" " ..	M	28	Top of turn table slipped down and jammed foot.
555	" 30....	" "	" " ..	M	28	Finger lacerated, nail off; dumping cinder car and caught finger.

556	" 25....	"	"	.....	"	"	..	M	43 Scalp cut; workman let concrete bar slip.
557	Sept. 3....	"	"	.....	"	"	..	M	29 Eye inflamed; particle of steel flew from saw and lodged in eye.
558	Aug. 11....	"	"	.....	"	"	..	M	50 Rail turned over and jammed foot.
559	" 21....	"	"	.....	"	"	..	M	48 Piece of cinder in eye.
560	" 31....	"	"	.....	"	"	..	M	29 Foot bruised; empty buggy upset pushing him against buggy of pig iron.
561	" 30....	"	"	.....	"	"	..	M	35 Ankle burned by hot iron.
562	Sept. 4....	"	"	.....	"	"	..	M	34 Neck and arm scalded while lifting slag from water.
563	" 16....	"	"	.....	"	"	.	M	36 Piece of ore rolled on finger and crushed it.
564	" 5....	"	"	.....	"		..	M	19 Scalp cut by piece of scrap which fell from vessel floor.
565	" 1....	"	"	.....	"	"	..	M	26 Jammed between locomotives and sides bruised.
566	" 5....	"	"	.....	"	"	..	M	32 Finger jammed against side of hatch and end taken off.
567	" 5....	"	"	.....	"	"	..	M	22 Forearm burned; fell against hot shell round.
568	" 7....	"	"	.....	"	"	..	M	28 Foot badly bruised while coupling cars.
569	" 6....	"	"	.....	"	"	..	M	21 Foot bruised; bar fell from chains.
570	" 6....	"	"	.....	"	"	..	M	23 Finger lacerated; shell blank fell.
571	" 6....	"	"	.....	"	"	..	M	50 Hand lacerated; while removing butt end of blank, caught between butt and saw.
572	" 2....	"	"	.....	"	"	..	M	32 Pierced index finger with piece of wire and abscess developed.
573	Aug. 31....	"	"	.....	"	"	..	M	30 Foot burned with molten metal.
574	" 30....	"	"	.....	"	"	..	M	32 Back sprained while lifting buggy.
577	Sept. 8....	"	"	.....	"	"	..	M	55 Piece of speigel rolled from car and crushed thumb.
578	" 14....	"	"	.....	"	"	..	M	49 Thumb crushed; caught under holder of hoisting chute.
579	" 8....	"	"	.....	"	"	..	M	31 Eyelid burned; piece of hot slag flew up.
580	" 5....	"	"	.....	"	"	..	M	32 Tongs slipped and cut leg; putting bar through finishing roll.
581	" 14....	"	"	.....	"	"	..	M	19 Cornea burned; while chipping shell, piece flew off bar and struck eye.
582	" 15....	"	"	.....	"		..	M	40 Leg burned; pouring heat, steel splashed.
583	" 15....	"	"	.....	"	"	..	M	23 Finger burned while screwing electric globe into socket.
584	" 15....	"	"	.....	"	"	..	M	44 Punctured wound; fell and struck rock.
585	" 3....	"	"	.....	"	"	..	M	39 Knee bruised; hammer glanced off steel.
586	" 9....	"	"	.....	"	"	..	M	50 Finger bruised; jammed between two boulders.
587	" 9....	"	"	.....	"	"	..	M	48 Finger jammed between two pieces of pig iron.
592	" 16....	"	"	.....	"	"	..	M	21 Toe crushed; bar fell.
593	" 20....	"	"	.....	"	"	..	M	21 Scalp cut; oil can fell from other workman's hand.
595	" 27....	"	"	.....	"	"	..	M	37 Fingers jammed; unloading car of dirt and piece rolled down.
596	" 17....	"	"	.....	"	"	..	M	42 Fell while bucking up rivets in bell and bruised arm and elbow.
597	" 16....	"	"	.....	"	"	..	M	35 Eye burned; piece of steel flew from saw.
598	" 21....	"	"	.....	"	"	..	M	24 Arm bruised; caught between two cars.
599	" 29....	"	"	.....	"	"	..	M	59 Toe jammed; casting fell off table.

*Fatal.

ACCIDENTS FOR THE YEAR 1916.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 1—Continued				
606	Sep. 16....	Algoma Steel Co.	Sault Ste. Marie ..	M	20	Leg burned by molten iron.
607	" 18....	" "	" " ..	M	25	Hands and face burned; starting box blew up covering hands with oil.
608	" 25....	" "	" " ..	M	19	While rolling shell, burr cut hand.
609	" 25....	" "	" " ..	M	45	End of finger cut off; while unloading guides, caught between chain and guides.
610	" 27....	" "	" " ..	M	29	Sprained back while charging buggy.
611	" 25....	" "	" " ..	M	16	Finger burned on emery wheel.
612	" 26....	" "	" " ..	M	27	Toe crushed by piece of scrap from buggy.
613	" 30....	" "	" " ..	M	29	Brick from ladle struck head, fracturing frontal sinews.
614	" 29....	" "	" " ..	M	45	Fell and struck chest against corner of car.
615	Oct. 3....	" "	" " ..	M	26	Fingers cut on billet; slipped and grasped edge.
616	" 2....	" "	" " ..	M	38	Punctured wound on forearm; piece of steel flew from steam hammer.
617	Sept. 23....	" "	" " ..	M	38	Knee cut; let bar fall.
618	" 28....	" "	" " ..	M	16	Finger jammed; shell dropped out of bucket.
619	Oct. 6....	" "	" " ..	M	29	End of finger crushed; hand caught with arm of crane.
620	Sept. 29....	" "	" " ..	M	53	Thumb crushed, loss of nail; caught between edge of pan and scrap.
636	" 30....	" "	" " ..	M	33	Wrenched back while cleaning out fire; hook of bar caught.
637	Oct. 7....	" "	" " ..	M	30	Chest bruised; fell against edge of steel door.
638	" 6....	" "	" " ..	M	26	Hand scratched while throwing switch, causing abscess.
639	" 10....	" "	" " ..	M	19	Punctured wound on hand; struck with pick.
640	" 10....	" "	" " ..	M	28	Finger jammed between rail and roller.
641	" 9....	" "	" " ..	M	29	Ankle broken; caught foot in feed gear wheel.
642	" 5....	" "	" " ..	M	36	Finger crushed; unloading scrap shell rounds.
643	" 10....	" "	" ..	M	26	Hand amputated above wrist; while cleaning block, cambering machine came down.
644	6....	" "	" " ..	M	28	Thumb lacerated, scalp and shoulder bruised; fell and rabel fell from shoulder.
645	" 4....	" "	" " ..	M	20	Punctured wound in foot; stepped on nail.
649	" 20....	" "	" " ..	M	56	*Leg crushed and had to be amputated; car switched into car he was working on. Died from injuries.
650	" 13....	" "	" " ..	M	34	Toe bruised; while repairing car, end door fell down.
651	Aug. 18....	" "	" " ..	M	28	Foot burned, infected; steel bounced out of mould.
652	Oct. 15....	" "	" " ..	M	43	Struck in eye by brass bearing.

653	" 14....	" "	" " ..	M	28	Foot crushed; car door fell.
319	May 31....	Canadian Barker Co.	" " ..	M	....	Finger badly cut; caught between lathe and wheel.
487	Aug. 8....	" "	" " ..	M	....	End of thumb off; caught between ram and head of crank shaper.
461	July 28....	Canadian Government Elevator	Fort William ...	M	....	Fingers injured, three amputated; caught in pedestal sheave.
65	Dec. 7, '15	C. N. Coal & Ore Dock	Port Arthur	M	34	Probable loss of four fingers and palm of hand; caught in gears of hopper.
66	" 14, '15.	" "	"	M	32	Struck on shoulder by lump of coal.
168	Feb. 23, '16.	" "	"	M	28	Strained left side; tripped.
169	Mar. 8....	" "	"	M	30	Bump on head; hit by bridge trolley cable.
170	" 7....	" "	"	M	43	Assisting to adjust pickup bell on anvil, same slipped and hit his side.
192	" 9....	" "	"	M	38	Bruised and shaken; pushed off moving car.
263	May 9....	" "	"	M	27	Slight scalp wound; piece of coal fell from bucket which was being raised.
264	" 10....	" "	"	M	24	Contusion of left foot; piece of coal fell from bucket.
277	" 13....	" "	"	M	29	Cut on hand; piece of iron scrap flew up and hit hand.
279	" 15....	" "	"	M	41	Contusion and bruises; was oiling wheel gears while bridge was moving.
354	June 13....	" "	"	M	38	Head, arms and legs injured; bucket came down on him, while looking for pick.
383	" 25....	" "	"	M	36	Struck on head by piece of coal from bucket.
384	" 22....	" "	"	M	35	Two fingers bruised; handle of bucket fell on hand.
385	" 24....	" "	"	M	25	Finger bruised; piece of coal fell from bucket.
406	July 4....	" "	"	M	35	Slight strain; overtaxed strength wheeling coal up plank.
407	" 6....	" "	"	M	29	Flesh wound on leg; struck by splinter off hammer.
408	" 15....	" "	"	M	30	Fell on stoker hopper and injured testicle.
458	" 28....	" "	"	M	23	Strained; fell over track.
509	Aug. 25....	" "	"	M	30	Arm broken; glove caught on cotter pin of tower bucket; lifted up and fell.
536	Sept. 5....	" "	"	M	41	Injured abdomen; slipped and fell into hopper.
589	" 19....	" "	"	M	27	Finger squeezed between sprocket chain and hopper.
307	May 8....	" "	"	M	47	Back strained while shovelling coal.
334	June 10....	" "	"	M	38	Hand squeezed between bucket and angle iron.
499	Aug. 12....	" "	"	M	....	Top of finger squeezed, nail off; caught in link.
621	Oct. 13.....	" "	"	M	27	Wound on temple; cleaning cars, stick flew up.
21	Nov. 6, '15	Canadian Pacific Railway Co.	Fort William	M	35	Window dropped on hand tearing away nail and flesh.
22	" 11....	" "	Kenora	M	20	Collar bone injured.
31	" 15....	" "	"	M	20	Leg jammed against turntable and deep wound inflicted.
46	" 18....	" "	Fort William ...	M	45	Wrist fractured; fell off ladder.
48	" 25....	" "	"	M	17	Arm fractured; sleeve caught in screwing machine.
49	" 26....	" "	Kenora.....	M	34	Toe crushed while removing bolt from end brass.

*Fatal.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 1—Continued				
75	Dec. 3, '15	Canadian Pacific Railway Co.	Kenora	M	32	Shoulder sprained and knee wrenched; fell while getting down from sand box.
76	" 12, '15.	" "	Fort William	M	25	Concussion of brain; knocked down while crossing in front of engine.
77	" 10 '15.	" "	Kenora	M	32	Knee bruised; tripped over canted floor board.
81	Nov. 5, '15.	" "	North Bay	M	45	Loss of two fingers; hand slipped on blade of saw.
92	Jan. 11, '16.	" "	"	M	30	Knee cap broken; crushed between a wheel, springs piled against wall.
99	Dec. 30, '15.	" "	Kenora	M	45	Hand burned; torch exploded.
100	Jan. 15, 16.	" "	North Bay	M	42	Shoulder dislocated; ladder slipped from under him.
101	" 3.	" "	Fort William	M	19	While releasing a grain door, projecting nail pierced instep.
102	" 2.	" "	"	M	46	Toe bruised; piece of shafting fell over.
103	" 22.	" "	"	M	22	Foot bruised; driving box wedge fell from frame.
130	" 14.	" "	"	M	....	*Fell into drop pit containing hot water, bady burned, died in few hours.
131	" 11.	" "	Kenora	M	26	Burns on eye, eyelid and ear; pouring babbitt into crosshead shoe for engine, metal blew into face.
171	Mar. 3.	" "	Fort Wiliam	M	....	Nail torn off thumb; jammed in carriage of scale spout.
191	" 17.	" "	North Bay	M	20	Face slightly burned by explosion while lighting gasoline burner.
216	Apr. 3.	" "	"	M	....	Foot bruised; while shifting driving springs, one rolled over.
261	May 9.	" "	"	M	25	Superficial cut on eyeball; nut from bolt broke eye glasses, pieces flew in eye.
278	" 9.	Fort Frances Pulp & Paper Co.	Fort Frances	M	36	*Stepped betwen high tension cables; slipped and fell across another cable forming a circuit.
591	Sept. 14.	" "	"	M	27	Great toe bruised and cut; dropped iron core on foot.
604	" 28.	" "	"	M	35	Three fingers cut while barking pulpwood.
605	" 30.	" "	"	M	52	Back and knuckles of hand cut; slipped and fell against barker knives.
23	Nov. 14, '15	Grain Growers' Export Co.	Fort William	M	23	Palm cut.
20	Oct. 27, '15.	" "	"	M	....	Blood poisen from injury to thumb; probable loss of thumb.
396	June 27.	" "	"	M	....	*Passing between cars in elevator, train came in and struck cars; caught between them.
280	Apr. 13.	Keewatin Lumber Co.	Keewatin	M	57	Blood poisoning in hand; ran sliver in finger.

281	May	3	"	"	.....	"	.....	M	19	Spine injured; crushed between tank and platform timbers.
282	Jan.	20	"	"	.....	"	.....	M	22	Shoulder strained while picking up bundle of edgings.
283	Mar.	20	"	"	.....	"	.....	M	....	Foot bruised; fractured bone of small toe; bearing slipped off shoulder.
284	"	9	"	"	.....	"	.....	M	38	Wound in eye; knot flew back from machine.
335	Feb.	8	Knight Bros. Co.		.....	Burk's Falls	.....	M	41	Knuckles cut with sand belt.
336	Mar.	9	"	"	.....	"	.....	M	16	Loss of index finger; cut in shaper.
337	Apr.	15	"	"	.....	"	.....	M	18	End of finger pinched off with lumber cart.
338	"	27	"	"	.....	"	.....	M	18	Muscles strained; struck on arm by piece of slab.
339	June	5	"	"	.....	"	.....	M	19	Muscles of ankle torn; stepping down from truck.
474	July	13	"	"	.....	"	.....	M	29	One bone of arm severed, other partly cut, while mitering pieces on saw.
241	Apr.	25	Lake Superior Paper Co.		...	Sault Ste. Marie	..	M	19	Four fingers cut; hand slipped off block of wood, striking knives.
242	"	28	"	"	...	"	" ..	M	30	*Chest crushed; while placing felt on machine, same accidently started, drawing him into press.
260	"	27	"	"	...	"	" ..	M	23	Hand bruised; caught between pocket of grinder and block of wood.
262	May	5	"	"	...	"	" ..	M	40	Hand cut by nail; moving plank, nail run into hand.
305	"	22	"	"	...	"	" ..	M	24	Thumb bruised; caught between wood and grinder pocket.
313	"	29	"	"	...	"	" ..	M	35	Roll of paper rolled on leg and injured it.
314	"	27	"	"	...	"	" ..	M	30	Hand cut; handling wood and hook slipped.
315	"	28	"	"	...	"	" ..	M	24	Palm of hand cut; lifting wood from tank, hook slipped.
316	"	31	"	"	...	"	" ..	M	26	Great toe injured; bolt fell on foot.
317	"	17	"	"	...	"	" ..	M	44	Legs injured; piece of wood fell.
318	June	6	"	"	...	"	" ..	M	46	Foot injured; log fell from car.
329	"	9	"	"	...	"	" ..	M	37	Two fingers cut; hand slipped on barker knives.
331	"	9	"	"	...	"	" ..	M	42	Hand jammed between blocks of wood and bruised.
332	"	12	"	"	...	"	" ..	M	....	Slightly burned by electricity.
357	"	11	"	"	...	"	" ..	M	45	Great toe injured; tripped while replacing rubber roll and press roll.
386	"	23	"	"	...	"	" ..	M	....	Struck on forehead by lever.
387	"	22	"	"	...	"	" ..	M	....	Foot bruised by roll of paper rolling on it.
391	"	27	"	"	...	"	" ..	M	....	Coupler caught sole of shoe causing slight bruise.
393	July	3	"	"	...	"	" ..	M	23	Hand crushed; caught between rolls while brushing dirt off felt.
409	"	12	"	"	...	"	" ..	M	....	Finger cut; hand caught by pulley and screw driver.
410	"	11	"	"	...	"	" ..	M	....	Slipped and slightly wounded leg.
411	"	21	"	"	...	"	" ..	M	....	Two fingers cut; hand slipped on barker knives.
412	"	12	"	"	...	"	" ..	M	41	Injured side; fell on cement floor.
413	"	21	"	"	...	"	" ..	M	52	Index finger cut, probable loss of same; hand caught spike chain on barker knives.
457	"	29	"	"	...	"	" ..	M	20	Thumb caught in gear while oiling drill, and nail pulled off.

*Fatal.

ACCIDENTS FOR THE YEAR 1916.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 1—Continued				
459	July 21....	Lake Superior Paper Co. ...	Sault Ste. Marie..	M	19	Two fingers cut; slipped on barker knives.
460	" 25....	" " ...	" " ..	M	....	Hand cut; handling wood with picaroon.
468	Aug. 3....	" " ...	" " ..	M	....	Struck in face by a block.
469	" 1....	" " ...	" " ..	M	22	Fingers cut on barker knives.
478	" 7....	" " ...	" " ..	M	25	Back injured; while placing chain on sprocke..
479	" 9....	" " ...	" " ..	M	18	Back injured; slipped and fell on saw table.
476	" 8....	" " ...	" " ..	M	....	Thumb nail cut off on barker knives.
481	" 5....	Little Current Lumber Co. ..	Little Current....	M	29	Loss of eye; struck by piece of wood thrown back from lath bolter.
547	Sept. 1....	" " ...	" ..	M	57	Back bruised; while harnessing horses, they started, cart struck him.
473	Aug. 4....	Maple Leaf Milling Co.	Kenora.....	M	30	Struck head on barrel table; jumped from elevator while in motion.
646	Oct. 25....	Matthews Sash & Door Co...	Fort William....	M	....	Thumb cut.
78	Dec. 17, '15.	Northern Foundry & Machine Co., Ltd.	Sault Ste Marie..	M	32	Wrist sprained, face cut; fell while pulling on belt.
622	June 27....	N. M. Patterson & Co.	Fort William....	M	30	*Oiling rope drive, arm became entangled, severing sinews, result, lockjaw.
623	" 6....	" "	"	M	28	Knee fractured; hand winch slipped, and struck knee.
392	Feb. 10....	Port Arthur Waggons & Implement, Ltd.	Port Arthur.....	M	24	Injured, extent not known.
486	Aug. 9....	" " ..	"	M	33	Thumb cut on shaper.
545	Sept. 9....	" " ..	"	M	59	Nails of three fingers scraped off on sand paper drum.
546	" 8....	" " ..	"	M	21	Thumb cut off; put thumb under iron shears.
306	May 10....	" " ..	"	M	38	Bones broken in foot; blown off lumber pile.
634	Sept. 19....	Shelvin-Clarke Co.	Fort Frances....	M	....	Leg bruised; fell off platform.
635	Oct. 5....	" "	"	M	....	Hip and back bruised; unloading lumber, load fell.
480	Aug. 10....	Spanish Mills Co.	Cutler.....	M	57	*Fell and fractured skull.
625	Sept. 27....	" "	"	M	....	Veins on back of hand cut at base of thumb; tooth flew out of band saw.
626	Aug. 29....	" "	"	M	42	Finger caught between slab and roof; badly smashed.
627	" 30....	" "	"	M	22	Nose broken; arm that raises saw broke and fell.
628	" 9....	" "	"	M	35	Log rolled on floor and crushed toe.
629	June 27...	" "	"	M	40	Hand lacerated by picaroon; board slipped.
630	" 20....	" "	"	M	22	Finger jammed between planks.
631	May 29....	" "	"	M	19	Laceration and contusion of ankle; caught in chain carrying sawdust.

632	June 14....	" "	"	M	42	Arm broken; caught in shafting and pulley.
633	May 19....	" "	"	M	24	Loss of portion of finger, other bruised; hand crushed between wheel and platform of carriage.
654	Oct. 30....	" "	"	M	24	Fell and struck hand on bolt of carriage bumper.
308	May. 20....	Spanish River Pulp & Paper Mills, Ltd.	Sturgeon Falls...	M	27	Flesh off end of finger; came in contact with disc barker knives.
309	" 5....	" " ..	"	M	16	Thumb badly jammed between two sticks of wood.
310	" 9....	" " ..	"	M	17	Rupture in side; struck by roll of paper.
311	" 29....	" " ..	"	M	19	Flesh off finger end; hand in contact with disc barker knives.
312	" 27....	" " ..	"	M	24	Portion of nail and flesh off end of finger by disc barker knives.
326	June 1....	" " ..	Espanola.....	M	38	Arm fractured, breast cut; while repairing oil feed pipe which broke.
327	" 2....	" " ..	"	M	30	Three fingers taken off by machine rolls.
328	May 21....	" " ..	"	M	39	Legs severely bruised; engine ran into car, upsetting rolls of paper.
330	June 9....	" " ..	Sturgeon Falls...	M	66	Cut on shoulder; struck by bolt in belt fastener.
356	" 15....	" " ..	"	M	20	Small toe crushed; block of wood fell while unloading and piling same.
388	" 20....	" " ..	Espanola.....	M	34	Finger cut while planing boards.
389	" 24....	" " ..	"	M	18	End of finger taken off by splitter.
390	" 15....	" " ..	"	M	17	Finger jammed and cut; caught in winder wheel.
394	" 29....	" ..	"	M	21	Two fingers cut and bruised; struck against drive shaft while carrying shaft.
395	" 30....	" " ..	Sturgeon Falls...	M	49	Cut on top of head; came in contact with motor belt.
414	July 16....	" " ..	Sault Ste. Marie..	M	35	Two fingers jammed and cut on ends; caught between bearing and end of shaft.
462	" 18....	" " ..	Sturgeon Falls...	M	21	Blood poison; blistered hand on truck handle.
470	" 27....	" " ..	"	M	18	Instep bruised; block of wood fell off barker table.
471	Aug. 2...	" " ..	"	M	34	Toe bruised; block of pulp wood fell off truck.
472	" 2....	" " ..	"	M	64	Finger end crushed; caught between leg of truck and frame.
475	" 7....	" " ..	"	M	25	Deep cut between thumb and finger by window glass.
500	" 15....	" " ..	Sault Ste. Marie.	M	27	Two fingers, back of hand bruised; caught in winder press rolls.
501	" 15....	" " ..	" " ..	M	18	Foot injured; block of wood dropped.
520	" 25....	" " ..	" " ..	M	24	Foot injured; stepped on piece of iron while working on screens.
521	Sept. 1....	" " ..	" " ..	M	41	Crusher plate slipped from crusher onto foot.
522	Aug. 30....	" " ..	" " ..	M	42	Foot injured; lifting block of wood to splitter and it slipped.
537	Sept. 5....	" " ..	" " ..	M	22	Hand cut while placing knives under stake.

*Fatal.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 1—Continued				
538	Sept. 5....	Spanish River Pulp & Paper Co.	Steelton.....	M	52	Fingers bruised; timber fell.
539	" 2....	" " ..	"	M	....	Pierced foot by stepping on nail.
540	Aug. 22....	" " ..	Sturgeon Falls...	M	50	Sprained left knee.
541	" 21....	" " ..	"	M	46	Arm scalded; hot water in barrel splashed.
542	" 25....	" " ..	"	M	65	Left hand cut and bruised; jammed between pulpwood blocks.
543	" 12....	" " ..	Sault Ste. Marie..	M	....	Top of foot bruised; slipped while pushing loaded truck.
544	Sept. 7....	" " ..	" " ..	M	22	Finger cut while taking wood from hog; hand slipped against knives.
549	Aug. 3....	" " ..	Steelton.....	M	40	Internal injuries in chest; fell on chain connecting booms.
550	Sept. 8....	" " ..	Sault Ste Marie...	M	....	Bone in ankle fractured; stepped in U drain.
575	" 7....	" " ..	Sturgeon Falls...	M	18	Cut between thumb and finger; hand struck by set screw in lathe.
576	" 9....	" " ..	" ...	M	18	Abrasion of skin and bruises on elbow and upper arm; drawn under cone, while shifting belt on lathe.
588	" 19....	" " ..	Sault Ste. Marie..	M	29	Fell on cement floor and bruised head and shoulder.
590	" 22....	" " ..	" " ..	M	17	Hand and arm bruised; caught between shaft and drum.
591	" 20....	" " ..	" " ..	M	21	Thumb jammed; caught between hook and rope.
600	Oct. 8....	" " ..	" " ..	M	42	Badly bruised; while putting belt on, thrown over pulley.
601	" 4....	" " ..	" " ..	M	21	Face cut and bruised; while clamping paper roll, bar slipped.
602	" 5....	" " ..	" " ..	M	21	Elbow jammed; fell on reel drum.
603	" 10....	" " ..	" " ..	M	46	Finger broken; while driving pinion out of shaft, follower struck hand.
624	" 5....	" " ..	" " ..	M	41	Finger cut; wrench slipped and hand struck gear.
648	" 27....	" " ..	" " ..	M	41	Hands burned; while connecting watt meter, short circuited lines.
647	" 25....	" " ..	" " ..	M	19	Hip and hand bruised; fell against belt operating bark press.
655	" 28....	" " ..	" " ..	M	25	Index finger bruised; hand dropped into calendar rolls.
657	" 31....	" " ..	" " ..	M	23	Head cut; struck by fellow employee with board.
456	May 22....	Stone Lumber Co.	Marksville.....	M	....	Hand taken off by circular saw.
45	Oct. 16....	Sudbury Construction & Machinery Co.	Sudbury.....	M	56	Laceration of muscles at back of thigh, explosion of dynamite caused piece of iron to strike him.

15	Nov. 14....	Western Terminal Elevator Co.	Fort William	M	34	Struck head against angle iron frame and caused scalp wound.
80	Dec. 28, '15.	" " .. "	.....	M	21	*Squeezed between draw bars while passing between box cars.
355	June 13....	" " ..	.....	M	42	Forehead cut; struck on a cross channel iron while moving quickly along top of moving cars.
467	Aug 4.....	" " .. "	.....	M	33	Finger bruised; caught between cable and car step.

DISTRICT No. 2.

11	May 22....	Blachford Shoe Co.	Toronto	M	15	Leg broken, head cut; fell down elevator shaft.
4	Dec. 6, '15	Burger Candy Co.	"	M	....	Arm bruised; fell down stairway.
10	Dec. 17, '15.	Capewell Horse Nail Co.	"	M	57	End of finger bone broken in milling cutter.
17	July 16....	Consumers' Gas Co.	"	M	27	Thigh injured by collapsing of scaffold.
18	" 20....	John Carlyle	"	M	49	Four fingers injured on jointing machine.
2	Nov. 19, '15	Dominion Toy Mfg. Co.	"	M	....	Portion of finger amputated; pin stuck in finger, and pure carbolic acid put in wound.
3	" 1915..	Firstbrook Bros., Ltd.	"	M	33	Finger severed between first and second joints by planer knife.
5	Dec. 6, '15	W. & J. G. Greey	"	M	27	*Explosion.
6	" 6, '15	" "	"	M	23	*Explosion.
7	" 6, '15	" "	"	M	28	*Explosion.
8	" 6, '15	" "	"	M	55	*Explosion.
9	" 6, '15	" "	"	M	60	Scalded through boiler explosion.
11	Feb. 10....	" "	"	M	....	Eye burned.
13	May 4....	" "	"	M	60	Foot burned; removing iron from furnace.
12	Feb. 25....	Imperial Optical Co.	"	M	....	*Caught by elevator and decapitated; attempted to board same while in motion.
19	1916.....	Moore Telford, Itd.	"	M	....	Loss of finger, hand badly smashed on printing press.
15	May 30....	Murray Printing Co.	"	M	....	Loss of right hand; left hand under power cutting machine too long.
16	June 6....	" "	"	M	....	Three fingers cut off right hand; cutting machine repeated.
1	Nov. 4, '15	Jos. Simpson Sons	"	M	....	Foot crushed between elevator and floor.

DISTRICT No. 3.

81	Sept. 2....	Amalgamated Ammunition Machinery Co.	Toronto.	M	....	*Skull fractured; oiling shafting on machine when it had started.
70	July 13....	Bœckh Bros. Co.	"	M	....	Bruised; fell down elevator shaft.
65	July 20...	Chapman Double Ball Bearing Co.	"	M	36	Finger nearly severed at root of nail; caught between crank and cog of stamping machine.

*Fatal.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 3—Continued				
66	May 1....	Chapman Double Ball Bearing Co.	Toronto.....	M	28	Loss of eye; chip of steel from die being placed in large press.
67	July 7....	" " ..	"	M	28	Portion of two fingers off by press.
68	July 7....	" " ..	"	M	22	Hand gashed; slipped on tool.
69	June 26....	" " ..	"	M	34	Emery dust in eye; bruise on eyebrow.
82	Aug. 19....	" " ..	"	M	15	Hand burned; lighting piece of rag saturated with benzine.
85	" 25....	" " ..	"	M	85	Index finger badly cut; placing hand on moving bearings.
90	Sept. 5....	" " ..	"	M	35	Finger bruised; shell fell on hand.
95	Oct. 27....	" " ..	"	M	40	Instep bruised; wrench fell on foot.
45	Mar. 25....	City Towel Apron Supply & Laundry	"	M	15	Neck bruised; looking through elevator shaft, caught by elevator.
76	Aug. 1....	Consumers Gas Co.	"	M	66	Finger broken and cut, also leg cut and bruised; cast iron plug fell off pile.
74	July 1916..	Dominion Paper Box Co ..	"	M	....	Three fingers crushed under stamping press.
75	" 1916..	" " ..	"	M	....	Finger crushed in bevel gear.
22	Jan. 21....	" " ..	"	M	22	Finger injured in gears of lining paper marchine.
2	Nov. 8 '15.	Grand Trunk Ry.	"	M	18	Ribs and collar bone fractured, also internal injuries; standing on back of tender, engine started, crushed between tender and door of shed.
3	" 6 '15.	" "	"	M	60	Leg bruised; putting grates on engine.
8	" 18'15.	" "	"	M	52	Great toe bruised; cross head pin dropped on it.
9	" 23 '15.	" "	"	M	58	Ankle bruised; grinding stone rolled on foot.
10	" 23 '15.	" "	"	M	15	Finger broken; brake rod fell.
11	" 19 '15.	" "	"	M	29	Leg and foot bruised; tender wheel fell.
12	" 30 '15.	" "	"	M	....	Foot crushed, bones broken; foot slipped, wheel of truck passed over it.
23	Jan. 24....	" "	"	M	42	Thumb bruised and cut; jammed between ragged end of bar and buffer beam of engine.
24	" 22....	" "	"	M	....	Big toe broken; hoisting rail with air hoist, slipped and rail dropped.
29	Feb. 19....	" "	"	M	52	Deep scalp wound; blow with sledge hammer over temple.
30	" 21....	" "	"	M	26	Foot bruised; bar of iron fell.
33	Mar. 15....	" "	"	M	33	Ear and face lacerated, severe bruises; clothing caught by drilling.
34	" 11....	" "	"	M	16	Knee cap dislocated; fell on shop service tracks.
35	" 5....	" "	"	M	21	Thumb bruised and cut; dropped an air motor on thumb.

44	Apr. 9....	" "	"	M	Finger burst; a jack fell.
60	July 3....	" "	"	M	Arm cut above elbow; sleeve caught by thread end of bolt in lathe.
72	" 17....	" "	"	M	Knee bruised; valve of air compressor blew out.
73	" 23 ...	" "	"	M	Knee injured; spanner slipped while tightening nut under crane.
80	Aug. 9....	" "	"	M	Great toe injured ; break beam fell off truck.
83	" 15....	" "	"	M	Shoulder injured; knocked against frame of tender and fell on a rail.
91	Sept. 12....	" "	"	M	Forearm injured; steel from top of swedge struck him.
98	Oct. 2....	" "	"	M	Toes bruised; piece of rail fell.
46	Apr. 28....	Geo. R. Gregg & Co., Ltd. ..	"	M	Arm crushed in machinery; neglected to turn current off before oiling elevator.
55	June 7....	Gutta Percha & Rubber, Ltd.	"	M	.... Acid burns on feet; unloading carboys of sulphuric acid, one fell and broke.
63	" 7....	" " ..	"	M	.... Wrist cut; lifting block of rubber out of tank, knife slipped.
64	July 11....	" " ..	"	M	.... Palm cut; hand struck end of protruding nail.
94	Sept. 14....	" " ..	"	M	.... Foot crushed and flesh sheared off.
96	" 28....	" " ..	"	M	.... Heel bruised; foot caught between elevator and floor.
97	" 28....	" " ..	"	M	.... Back sprained; while raking ashes out of fire box in boiler.
99	Oct. 10....	" " ..	"	M	.... Scalp wound on top of head; iron bar fell.
18	Dec. 29 '15.	E. H. Harcourt.	"	M	.... Fingers broken and hand crushed; feeding platen press.
13	Nov. 24, '15	Jones & Moore Co.....	"	M	.... Rib fractured; stepped into trap door and fell into cellar.
5	" 16, '15	Lawrence Bakery.	"	M	45 Wrist lacerated in hay cutting machine.
52	May 28....	McGregor & McIntyre Ltd.	"	M	.... Loss of arm, back and chest bruised; caught in belt and whirled around shafting.
41	Feb. 29....	St. Lawrence Starch Co. ..	Port Credit. ..	M	15 Bone broken below hip; fell down elevator shaft.
42	Mar. 17....	" " ..	" " ..	M	48 *Hit by handle of a winch on head.
56	June 2....	" " ..	" " ..	M	28 Put hand in running elevator boot to remove obstruction and cut it.
57	" 19....	" " ..	" " ..	M	30 Lost nail on finger while dressing boards on buzz planer.
1	Nov. 1 '15.	Steel & Radiation.	Toronto.	M	32 Rupture of cords; lifting keg of bullets up to filling machine.
21	Jan. 14....	" "	"	M	55 One toe broken, another crushed; shell fell from pile.
20	" 17....	" "	"	M	40 Foot bruised and crushed; billet fell.
4	Nov. 1 '15	" "	"	M	45 Thumb cut; scratched against shell.
6	" 19, '15	" "	"	M	.... Face and hands burned; waste caught fire.
14	Dec. 11, '15	" "	"	M	.... Fingers ground while grinding shells.
15	" 14, '15	" "	"	M	50 Bruised, and ribs fractured; wrench slipped while tightening chuck on lathe.
16	" 22, '15	" "	"	M	42 Finger injured; caught in cuttings on spindle.
17	" 28, '15	" "	"	M	56 Thumb knocked against machine and cut knuckle.
19	Jan. 17....	" "	"	M	37 Thumb cut; piece of tin caught in belt and struck hand.

*Fatal.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 3—Continued				
25	Feb. 4....	Steel and Radiation	Toronto	M	....	Partial amputation of finger; placing bush in jig, finger caught betwen drill and shell billet.
26	" 10....	" "	"	M	....	Two fingers crushed; caught while turning gear on machine.
27	" 11....	" "	"	M	21	Two fingers crushed and bruised; shell fell from truck.
28	" 25....	" "	"	M	....	Shot through leg; accosted by stranger.
31	Mar. 6....	" "	"	M	....	Hands and arms severely burned; been washing shells in oil, had fingers bandaged and lighted pipe.
32	" 11....	" "	"	M	38	Bruise in temple; struck by bullet which was thrown.
36	" 11....	" "	"	M	....	Finger bruised; caught between body of machine and shell vise.
37	Feb. 24....	" "	"	M	....	Hand severely burned; hands bandaged for washing shells in oil, and lighted pipe.
38	Mar. 19....	" "	"	M	29	Foot crushed; shell fell.
39	" 31....	" "	"	M	17	Knee cut severely; fell while carrying shells.
40	Apr. 7....	" "	"	M	32	Hands, arms, and face burned; burning refuse in furnace.
43	" 14....	" "	"	M	23	Finger severely cut while gauging shell on lathe.
47	May 3....	" "	"	M	28	Finger crushed; while turning turret lathe, bar slipped and started lever.
48	" 11....	" "	"	M	38	Pierced artery in leg, piece of steel flew from tool, when struck with sledge hammer.
49	" 22....	" "	"	M	36	Thumb amputated at first joint, caught between cogs.
50	" 17....	" "	"	M	22	Wrist sprained and finger cut; while cleaning shell, caught in shaft.
51	" 19....	" "	"	M	38	Severe cut on hand; tool slipped in lathe.
53	June 1....	" "	"	M	31	Slipped and ruptured cords of back.
58	" 20....	" "	"	M	46	Abrasion of shin, ankle and instep; slipped and let keg fall.
59	" 27....	" "	"	M	41	Hand crushed between shell and tool; machine started, putting in shell.
61	July 7....	" "	"	M	44	Wrist broken; putting on belt, ladder slipped, and he fell.
62	" 4....	" "	"	M	40	Rib broken; screwing shell into chuck, wrench broke, and he fell.
71	" 9....	" "	"	M	51	Knuckle crushed; caught in twist drill.
77	" 21....	" "	"	M	31	Arm bruised badly.
78	" 25....	" "	"	M	32	Finger cut on shell; got dirt in it, blood poisoning resulted.

79	"	17....	"	"	.....	"	.....	M	.... Finger burst; handling shells, one fell.
81	Aug.	16....	"	"	.....	"	.....	M	40 Ribs injured; fell on long wrench.
86	"	24....	"	"	.....	"	.....	M	22 Small bone in thumb broken; caught in spinner.
87	Sept.	2....	"	"	.....	"	.....	M	33 Finger badly cut; caught between shell and bench.
88	"	2....	"	"	.....	"	.....	M	46 Knee badly bruised; jammed between post and truck load.
92	"	21 ...	"	"	.....	"	.....	M	26 Top of finger off at first joint; on shears.
93	Oct.	2....	"	"	.....	"	.....	M	41 Burned on face, arms and hand by gas flames from furnace.
100	"	27....	"	"	.....	"	.....	M	26 Bone in foot broken and toe off; shell fell from truck.
7	Nov.	19, '15	Telfer Manf. Co.			"	.....	M	17 End of finger pinched in gumming machine gears.
89	Sept.	1916...	"	"	.....	"	.....	M	.... Loss of three fingers and portion of thumb on paper cutter.
54	May	25....	Toy Products of Canada.....			"	.....	M	20 Knee cut; contact with saw.

DISTRICT No. 4.

3	Oct.	8....	Chas. Barber & Sons.			Meaford.	M	.... Loss of three fingers on jointer.
28	Apr.	28....	" "			"	M	29 Leg and foot badly bruised; drilling casting when drill broke.
21	Mar.	27....	Canadian Explosives Ltd. ..			Nobel	M	.... Severely burned; boiler explosion.
22	"	27....	" " ..			"	M	.... Wrist, face and neck burned, finger sprained; caught by boiler explosion.
24	"	27....	" " ..			"	M	.... Small, superficial contused wound, by boiler explosion.
23	"	27....	" " ..			"	M	.... Knee joint injured; by boiler explosion.
33	June	27....	" " ..			"	M	.... *Died from effects of inhaling acid fumes.
35	"	21....	" " ..			"	M	51 Burns on hands and forehead, nervous shock; charging house explosion.
36	"	21....	" " ..			"	M	20 *Burns; charging house explosion.
37	"	21....	" " ..			"	M	19 *Burns; charging house explosion.
38	"	21....	" " ..			"	M	23 *Burns; charging house explosion.
39	"	21....	" " ..			"	M	21 *Burns; charging house explosion.
40	"	21....	" " ..			"	M	22 *Burns; charging house explosion.
41	"	21....	" " ..			"	M	24 *Burns; charging house explosion.
42	"	21....	" " ..			"	M	21 *Burns; charging house explosion.
43	"	21....	" " ..			"	M	19 Burns; charging house explosion.
44	"	21....	" " ..			"	M	21 Burns; charging house explosion.
45	"	21....	" " ..			"	M	35 Burns; charging house explosion.
46	"	21....	" " ..			"	M	22 Burns; charging house explosion.
47	"	21....	" " ..			"	M	22 Burns; charging house explosion.
48	"	21....	" " ..			"	M	49 Burns; charging house explosion.
49	"	21....	" " ..			"	M	22 Burns; charging house explosion.
50	"	21....	" " ..			"	M	42 Burns; charging house explosion.
51	"	21....	" " ..			"	M	38 Burns; charging house explosion.
52	"	21....	" " ..			"	M	24 Burns; charging house explosion.
53	"	21....	" " ..			"	M	56 Burns; charging house explosion.
54	"	21....	" " ..			"	M	42 Burns; charging house explosion.
55	"	21....	" " ..			"	M	31 Burns; charging house explosion.

*Fatal.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 4—Continued				
56	June 21....	Canadian Explosives, Ltd. ..	Nobel.....	M	20	Burns; charging house explosion.
57	" 21....	" " ..	"	M	19	Injured; charging house explosion.
58	" 21....	" " ..	"	M	58	Punctured wound on forehead; explosion.
59	" 21....	" " ..	"	M	20	Injured; charging house explosion.
60	" 21....	" " ..	"	M	19	Injured; charging house explosion.
61	" 21....	" " ..	"	M	....	Injured; charging house explosion.
62	" 21....	" " ..	"	M	23	Injured; charging house explosion.
63	" 21....	" " ..	"	M	48	Burns; charging house explosion.
11	Nov. 23 '15.	Collingwood Shipbuilding Co. Ltd.	Collingwood.	M	....	*Fell through hatch to bottom of boat, 25 feet.
77	Sept. 6....	Cooke & Co.	Georgetown. ...	M	....	Fell, ankle caught, twisting it completely around.
1	Oct. 29....	Fisher Motor Car Co.	Orillia.	M	18	Thumb cut while operating milling machine.
30	May 22....	Galt Paper Box Co.	Galt.	F	17	Finger caught in staying machine.
73	July 15....	Guelph Paper Box Co.	Guelph.	F	13	Finger ends crushed; hand too close to knife of slatter.
75	Aug.28.....	Guelph Worsted Spinning Co.	"	F	15	Finger nipped at spinning frame; had to be amputated.
16	Jan. 20....	Hilborn Co., Ltd.	Ayr.	M	....	Flesh around knuckle cut while feeding planer.
64	Dec. 25 '15.	Midland Engine Works.	Midland.	M	31	Eyes burned; pouring babbitt, metal flew over face.
65	Feb. 19....	" "	"	M	20	Thumb cut, hand swollen; struck with sledge.
66	Apr. 18....	" "	"	M	35	Two toes crushed by casting being lowered.
67	May 30....	" "	"	M	15	End of finger off, also nail, flesh and piece of bone; changing feed on lathe.
68	Apr. 7....	" "	"	M	28	One forgeing slipped, pinning two fingers against another forgeing.
69	May 4....	" "	"	M	67	Two ribs broken; slipped and fell from pile of steel bars.
70	June 14....	" "	"	M	30	Elbow struck emery wheel while removing shaft from a lathe.
71	" 21....	" "	"	M	60	Side injured by fall when wrench slipped.
78	Sept. 7....	" "	"	M	25	Toes injured; shell fell on foot.
79	Oct. 2....	" "	"	M	21	Abrasion of joint of finger through fall downstairs, result blood poisoning.
19	Mar. 15....	Neustadt Mfg. Co.	Neustadt.	M	....	Fingers hurt, arm cut; piece of board thrown back from saw.
2	Oct. 18 '15.	North American Bent Chair Co.	Owen Sound. ..	M	17	Palm of hand cut; working on chuck machine.
8	" 14 '15.	" "	" " ...	M	54	Strained; slipped while pushing truck.
9	Nov. 24 '15.	" "	" " ...	M	52	Finger cut on boring machine.
10	Nov. 27 '15.	" "	" " ...	M	17	Rib broken ; fell down elevator shaft.

13	Dec. 6 '15.	" "	" " ...	M	35	Bruised and shaken up; slipped coming down stairs.
20	Feb. 24....	" "	" " ...	M	22	Thumb smashed; carrying case of chairs, let it fall.
7	Nov. 29 '15.	Owen Sound Chair Co.	" " ...	M	....	Ends of thumb and two fingers taken off in rollers while taking stock from planer.
12	Dec. 1 '15.	Preston Furn Co.	Preston.	M	....	One finger off; put fingers too close to rip saw.
14	Dec. 8 '15.	" "	"	M	....	Fingers cut on rip saw.
72	Aug. 29....	Stevens Hepner Co.	Port Elgin.	M	....	End of finger off while operating jointer in woodworking department.
4	Nov. 17 '15.	Waterloo Mfg. Co.	Waterloo.	M	....	Thumb badly cut; hand slipped on rip saw.
5	" 24 '15.	" "	"	M	....	Finger cut while operating lathe, removing brass cuttings.
15	Jan. 12....	" "	"	M	....	Finger cut off in front of nail; while operating shears, iron slipped.
17	" 20....	" "	"	M	....	Two fingers severely cut causing blood poisoning; grinding casting, slipped, hand struck emery wheel.
18	" 31....	" "	"	M	....	Axle thrown on foot severing ligaments and fracturing two toes, others severely bruised.
25	Apr. 19....	" "	"	M	....	Tongue cut, jaw severely bruised, rendered unconscious; releasing separator machine with pole, when pole flew up.
26	" 29....	" "	"	M	....	Three fingers crushed; while removing casting from moulding boxes with crane, hand caught in cogs of gears.
27	May 12....	" "	"	M	....	Two ribs broken, another cracked; breaking cast scrap iron with sledge, tripped and fell.
29	" 26....	" "	"	M	....	Sliver of wood in arm while operating rip saw.
32	June 1....	" "	"	M	....	Finger cut; sudden contact of truck with elevator caused release of safety gates which fell on fingers.
34	July 3....	" "	"	M	....	Steel chip in right thumb under nail; result, blood poisoning.
74	Sept. 5...	" "	"	M	....	Great toe broken; heavy iron bar fell on foot.
76	" 6....	" "	"	M	....	Flesh torn from finger tip; caught between edge of machine and board.
31	May 30....	Watson Mfg. Co.	Ayr.	M	....	Loss of portion of two fingers on rip saw.

DISTRICT No. 5

8	Dec. 18, '15.	Almonte Knitting Co.	Almonte.....	M	....	Finger broken; hand caught between quadrant and frame of spinning machine.
10	Jan. 11....	" "	"	M	....	Finger lacerated; caught in feed roll of carding machine.
18	Feb. 29....	" "	"	M	....	Thrown to floor while taking off a card driving belt.
23	May 1....	" "	"	M	....	Finger cut; picking waste off spool stand of card, finger caught between end of spool drum and frame of stand.
25	.....1916.	" "	"	F	....	Foot pierced; let pair of shears fall.

*Fatal.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 5—Continued				
24	May 19....	Atchison & Co.	Cornwall.....	M	....	Loss of three fingers and hand between thumb and little finger.
16	Feb. 11....	Beach Furniture, Ltd.	"	M	....	Fell and cut arm on revolving sand belt.
32	June 9....	" "	"	M	....	Split thumb of right hand.
54	Oct., 1916..	" "	"	M	....	Scratched hand on cauls.
55	" 23....	" "	"	M	....	Struck himself with a hammer.
50	Aug. 26....	Blackburn Bros.	Ottawa.....	M	14	Playing around belt and lost finger.
51	Oct. 12....	" "	"	F	40	Flesh wound on finger from punch.
14	Jan. 27....	S. & H. Bourbridge	"	M	....	Portion of finger removed; standing near power splitting machine, hand too near cog wheels.
15	" 18....	" "	"	M	....	Cleaning switch; slipped and received electric shock.
20	Mar. 11....	" "	"	M	....	Finger off above first joint; operating electric power press.
33	June 23..	" "	"	M	....	Finger cut on power punching machine.
41	Aug. 17....	" "	"	M	....	Finger jammed between jack and steel rim of auto tire while making covers.
2	Nov. 15, '15	Can. Cottons, Ltd.	Cornwall.....	F	14	Loss of finger at first joint and tip of other finger on gears of spinning frame.
40	Aug. 16...	" "	"	M	26	Scalded by steam on arms and body; valve bonnet blew out.
45	" 21....	" "	"	M	....	Deep gash in right arm; tripped and fell against table which had nail sticking out.
21	Apr. 4....	Capital Brewing Co.	Ottawa.....	M	....	Ribs and muscles on side bruised; horses cramped wagon which overturned.
35	June 29....	" "	"	M	....	Wrist sprained, leg bruised, fell from truck.
37	July 22....	" "	"	M	....	Wrist cut by piece of broken bottle.
42	Apr. 13....	Jas. O. Cluff	Maxville.....	M	31	*Cut in two; went over back of circular saw.
19	Mar. 1....	General Supply Co. of Canada	Ottawa.....	M	70	*Fracture at base of skull; fell into elevator shaft.
36	July 4....	Jas. Davidson Estate	"	M	16	Leg badly cut; caught in head of frame groover.
26	Apr. 20....	Hawkesbury Lumber Co.	Hawkesbury.....	M	65	Finger cut on re-saw.
29	May 20....	" "	"	M	63	Foot caught in bolt, straining side.
30	" 15....	" "	"	M	24	Arm hurt by flying sliver from bolter.
31	" 4....	" "	"	M	76	Truck ran over foot.
56	Oct. 5....	Leslie & Son	Ottawa.....	M	15	End of finger crushed in press.
17	Jan. 15....	Lowe Martin Co.	"	F	19	Fingers badly bruised in rolls of reeling machine.
13	" 19....	McGill Chair, Ltd.	Cornwall.....	M	....	Thumb cut; while boring rockers, one slipped and split.
11	July 24....	McLaren Lumber Co.	Brockville.....	M	....	Hands and head burned; fire blew back out of fire box.
12	Aug. 5....	" "	"	M	21	Hand cut; slipped into saw.

52	Oct. 6....	Maple Leaf Condensed Milk Co.	Chesterville	M	....	*Killed by collapse of tank.
46	Aug. 21....	Morel Bros.	Ottawa	M	....	Injured by explosion of a gas tube.
47	" 21....	"	"	M	....	Injured by explosion of a gas tube.
38	July 11....	Ontario Wheel Co.	Gananoque	M	16	Loss of little finger; hand caught in gears of spoke sander machine.
48	Sept. 1....	Ottawa Car Mfg. Co.	Ottawa	M	29	Injured in groin; explosion occurred, mandril struck him.
49	Aug. 21....	" "	"	M	65	Skin removed from back of hand; caught between gate and bottom of elevator.
27	May 31....	Peerless Garage Co.	"	M	....	Auto fell down elevator shaft; man was bruised.
28	June 1....	Perth Felt Co.	Perth	M	18	Loss of finger; caught between tumbler and licocine of cardend machine.
53	Oct. 10...	Prescott Emery Wheel Co.	Prescott	M	43	Bone in heel broken; fell off car door.
34	May 18....	Rideau Power Co.	Merrickville	M	32	*Skull broken, internal injuries, legs and arms broken; adjusting belt on pulley on main shaft.
39	Aug. 1....	Riordan Pulp & Paper Co.	Hawkesbury	M	27	*Instant death; caught between elevator and brace on elevator shaft.
43	" 8....	Rosamond Woolen Co.	Almonte	M	43	Finger caught between rollers of worsted drawing machine.
44	" 8....	" "	"	M	....	Instep cut; caught foot between frame of carding machine and gear.
5	Nov. 4, '15	St. Lawrence Brewery, Ltd.	Cornwall	M	32	*Killed by shock from electric switch.
6	" 3, '15	"	"	M	27	*Killed by shock from electric switch.
4	" 15, '15	Toronto Paper Co., Ltd.	"	M	18	Arm amputated; drawn into rolls of plater.
7	Dec. 10, '15	H. K. Wampole & Co.	Perth	M	40	Small bar of flesh off finger while working on soap press
9	Jan. 5, '16.	" "	"	M	37	End of finger cut off on soap press.
22	Mar. 15....	Welk & Tank	Eganville	M	35	*Wound around shaft; caught on projecting set screw on shaft.
1	Nov., 1915.	Almonte Knitting Co., Ltd.	Almonte	F	....	Hand bruised; caught between revolving take up and knitting machine.
3	" 1915..	" "	"	M	....	Snipped top off finger with cutting shears.

DISTRICT No. 6

525	Apr. 11....	Acme Stamping & Tool Works	Hamilton	M	40	Finger caught between dies while operating press.
526	" 7....	" " "	"	M	15	Two fingers caught in press while putting parts through trimming dies.
678	May 18....	" " "	"	M	17	Finger caught between dies of power press.
693	" 29....	" " "	"	M	18	Finger caught between work and power press.
724	June 2....	" " "	"	M	43	Index finger severed at first joint while putting parts through forming operation.
804	" 24....	" " "	"	M	20	Finger cut by sharp point while blanking parts.
851	" 2....	" " "	"	M	16	Finger severed at first joint on power press.

*Fatal.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 6—Continued				
949	July 28....	Acme Stamping & Tool Works	Hamilton.....	M	15	Knee cut by prong of steel.
950	" 28....	" " "	"	M	25	Face bruised badly; end of ladder caught in pulley and struck face.
1178	Sept. 29....	" " "	"	M	37	Metal flew in face and right eye burning both.
1266	Oct. 19....	" " "	"	M	22	Loss of two fingers at second joint; caught between dies on power press.
1267	" 18....	" " "	"	M	18	Loss of three fingers; stool slipped and hand went between dies.
16	Nov. 18, '15	American Can Co.	"	M	20	Piece off first joint index finger; used finger to remove ear from die of press.
57	" 24, '15.	" "	"	M	22	Infected thumb; spilled acid on burned hand.
62	" 22, '15.	" "	"	M	19	Collis fracture; hand caught in conveyor of soldering machine.
98	Dec. 3, '15.	" "	"	M	18	Finger cut and infection developed.
195	Jan. 12.....	" "	"	M	18	Finger badly cut and bruised; caught while straightening strap in press.
200	" 7.....	" "	"	M	17	Loss of thumb at first joint; crushed on bumping press.
259	" 15....	" "	"	M	42	Back strained; lifting box.
260	" 19....	" "	"	M	20	Three fingers amputated; fellow workman tripped press.
329	Feb. 22....	" "	"	M	36	Finger torn, required stitching; screw came loose from pilot on chuck, caught edge of top throwing it back on hand.
382	Mar. 2....	" "	"	M	26	Finger badly cut; turning sheet around while feeding press, caught on ragged edge.
383	" 2.....	" "	"	M	18	Finger badly crushed, amputated at first joint; put finger in die to take out piece of tin.
518	" 3.....	" "	"	M	15	Finger badly crushed, amputated at first joint; ring caught in cog wheel.
778	June 7.....	" "	"	M	24	Tips of fingers badly crushed, all four fingers amputated near third joint on gang press.
884	" 29.....	" "	"	M	18	Finger crushed, amputated; jammed between forming ram and head, while straightening ring.
1082	Aug. 31.....	" "	"	M	31	Finger badly crushed; turning fly wheel when same slipped.
1147	Sept. 8.....	" "	"	M	18	Finger amputated near second joint on press.
1148	" 1.....	" "	"	M	17	Two fingers amputated at first joint; press repeated.

1189	" 25....	" "	"	M	19	Index finger amputated at first joint on press.
1251	Oct. 5....	" "	"	M	26	Thumb crushed, nail off; jammed between punch and die.
1149	Sept. 14....	American Cyanamid Co. ...	Niagara Falls....	M	....	Shock; caused by explosion.
1150	" 14....	" " ...	"	M	....	Burns on face and arms; explosion in aloxite furnace room.
1151	" 14....	" " ...	"	M	....	Shock, superficial burns on shoulder, chin cut; explosion in aloxite furnace room.
1152	" 14....	" " ...	"	M	....	Shock, deep cut on leg; explosion in aloxite furnace room.
183	Jan. 12....	Arnold Thompson Tool Co. .	Woodstock.....	M	17	Hand badly pierced; carrier on drill slipped and head of bolt driven into hand.
921	July, 1916..	Bain Wagon Co.	"	M	....	Hand badly bruised while operating skein setter.
1083	Aug. 21....	" "	"	M	....	Finger pinched between wagon box bottoms standing on ends, threatened with lockjaw.
1170	Sept. 9....	Bean & Westlake	"	M	71	*Injury to neck and spine, internal injuries, also cuts and bruises; caught in elevator shaft.
1188	" 20....	" "	"	M	67	Ankle sprained; lost balance and fell from ladder.
137	Dec. 8, '15.	Berlin Machine Works	Hamilton.....	M	....	Toes bruised; dropped casting on foot.
201	Jan. 7.....	" "	"	M	....	Finger severely cut while operating grinding machine.
516	Mar. 31....	Bertram & Sons Co.	Dundas.....	M	....	Head and body injured; while painting machinery, steel bars fell from travelling crane onto head
552	Apr. 12....	" "	"	M	....	Two fingers bruised; lifting casting out of tumbling mill.
561	Mar. 28....	" "	"	M	....	Foot severely bruised; casting fell on foot.
847	June 24....	" "	"	M	....	Leg broken at ankle; beam slipped out of sling, striking back and rolled down.
913	July 19....	" "	"	M	....	Leg broken and arm cut; machine overbalanced and fell.
920	June 30....	" "	"	M	....	Hand severely cut; came in contact with gear on shell boring machine.
967	July 29....	" "	"	M	....	Finger smashed; while measuring outside of shell caliper caught on shell.
1002	Aug. 8....	" "	"	M	....	Severe burn on back of hand; boiling resin from shell ran over hand.
1003	" 4....	" "	"	M	....	Severe bruise on instep; wheeling large gear, same fell.
1205	Sept. 25....	" "	"	M	....	Collar bone broken, jaw bruised, cuts and bruises; elevator dropped.
1211	Oct. 6....	" "	"	M	....	Fingers cut on edge of undercut for copper band on shell.
554	Mar. 22....	Boston Insulated Wire & Cable Co.	Hamilton.....	M	....	Great toe crushed; small reel of wire slipped and fell.
173	Dec. 30, '15.	Brook Woolen Co.	Simcoe.....	M	....	*Caught in shafting in some unaccountable manner and was killed.
644	May 9.....	Burlington Steel Co.	Hamilton.....	M	29	Foot bruised; while unloading rails.
694	" 22....	" "	"	M	40	Finger cut by chisel.
707	" 23....	" "	"	M	24	Shoulder burned by bar coming from rolls.
737	June 1....	" "	"	M	26	Bad scalp wound; hook caught on rail causing end to swing around.

*Fatal.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 6—Continued				
821	June 19....	Burlington Steel Co.....	Hamilton.....	M	31	Finger crushed; caught in pusher for shoving rails through furnace.
822	" 20....	" "	"	M	24	Foot burned; while pulling bars from rolls.
918	July 14....	" "	"	M	49	Tongs jammed into groin and stomach; slightly hurt.
919	" 23....	" "	"	M	....	Finger badly burned while shearing bar.
933	" 9....	" "	"	M	23	Face and thigh injured; fan on furnace came out unexpectedly while being repaired.
934	" 8....	" "	"	M	52	Badly lacerated thumb by chain on crane slipping.
975	Aug. 1....	" "	"	M	23	Foot bruised: rail fell off pile.
885	July 3....	" "	"	M	24	While fixing roll, piece of wire ran into arm and cut it.
886	May 24....	" "	"	M	38	Struck on knee by bar coming from furnace.
1012	Aug. 10....	" "	"	M	20	Leg bruised; wire holding bundle of steel broke, wire fell on leg.
1050	" 14....	" "	"	M	22	Palm cut with rims of tongs.
1153	Sept. 11....	" "	"	M	28	Thumb crushed; end of rail fell.
1165	" 21....	" "	"	M	21	Foot crushed slightly; rail fell.
91	Dec. 8, '15.	Canada Glue Co., Ltd.	Brantford.....	M	20	Skull fractured and both legs broken; caught in shaft and wound around it.
560	Apr. 2....	Canadian Billings & Spencer Co.	Welland.....	M	....	*Reached through drop hammer or fell through; at same time putting foot on treadle releasing rim which fell on his head killing him instantly.
202	Dec. 17, '15	Canadian Chadwick Metal Co..	Hamilton.....	M	....	Forefinger smashed on threshing machine; had to be amputated.
1323	Oct. 16....	" " "	"	M	....	Leg bruised; pulling loaded table truck on casters, same toppled over.
1324	" 20....	" " "	"	M	....	Forehead bruised in falling through an epileptic fit.
60	Nov. 26, '15.	Canadian Cottons, Ltd.	"	M	....	Burns, and collar bone broken; smock caught on projecting set screw while putting belt on pulley of dye machine.
61	" 24, '15.	" "	"	F	14	Finger crushed in gears of loom.
309	Feb. 12....	" "	"	F	....	Flesh and nail partly off finger; caught between rolls of spinning frame.
315	" 22....	" "	"	M	17	Arm cut; fell against window.
316	" 24....	" "	"	F	15	Finger pinched between gears on ring spinning frame.
540	Mar. 23....	" "	"	M	27	End of thumb crushed, nail off; replacing lap roll on picker.
549	Apr. 17....	" "	"	M	48	Great toe crushed by large pulley falling on it.

710	May 23....	"	"	.....	"	M	.... Two fingers cut and bruised while cleaning out trunk of picker.
808	June 12....	"	"	.....	"	F	15 Fell and bruised elbow resulting in illness.
1055	Aug. 28....	"	"	.....	"	M	.... Nails off two fingers, back of hand scraped; caught between rollers on picker.
1094	Sept. 11....	"	"	.....	"	F	14 Thigh broken, knee crushed, and leg scraped; caught between tin cylinders in ring spinning frame.
265	Dec. 15, '15.	Canadian Crocker-Wheeler Co.		.....	St. Catharines.	M	17 Two fingers badly cut; caught hand between punch and die.
752	May 31....	"	"	..	"	M	.... Top of finger cut off at first joint while feeding blanks in punch press.
751	" 30....	"	"	..	"	M	21 Finger severed at second joint; while grinding, caught betwen wheel and tool.
1264	Oct. 9....	Canadian Linderman Co., Ltd.		.....	Woodstock.....	M	.... Toe crushed; truck of shells overturned.
1265	" 12....	"	"	..	"	M	.... Finger crushed; let shell roll on hand.
2	Nov. 4, '15.	Canadian Ramapo Iron Works			Niagara Falls...	M	.... Ankle bruised; piece of rail fell on it.
262	Jan. 12....	"	"	..	"	M	.... Leg broken; caught between planer and wall.
263	" 20....	"	"	..	"	M	.... Blood poisoning in foot; was changing a roller on rail skids and dropped same on foot.
332	Feb. 28....	"	"	..	"	M	.... Two ribs broken; wrench slipped off bolts and hit his ribs.
12	Nov. 3, '15	Canadian Shredded Wheat Co.			"	M	43 Finger amputated; caught in rope of hoisting engine.
13	" 8....	"	"	..	"	M	50 Finger cut on electric light globe while cleaning it.
14	Oct. 27....	"	"	..	"	M	62 Finger bruised; caught in pulley while hanging sash in window.
15	Nov. 10....	"	"	..	"	M	19 Hit on nose and cut by falling bundle of shooks.
686	May 23....	"	"	..	"	M	35 Ball of foot injured; stepped on rusty nail.
996	Aug. 8....	"	"	..	"	M	23 Finger bruised on biscuit rack.
386	Mar. 7....	"	"	..	"	M	40 Back and thumb sprained; slipped and fell.
303	Jan. 18....	Canadian Steel Foundries, Ltd.		.....	Welland.	M	29 Ribs broken, car of slag was dumped on him.
307	Feb. 7....	"	"	..	"	M	25 Foot burned by molten steel while pouring heat.
310	" 2....	"	"	..	"	M	39 Head bruised; struck against a tray of shells.
311	" 1....	"	"	..	"	M	32 Contused blood vessel and bone; caught foot against piece of steel and edge of bar.
339	" 22....	"	"	..	"	M	20 Lacerated finger; handling shells, one fell over.
340	" 23....	"	"	..	"	M	27 Badly contused finger; fellow workman kicked bar which caught hand against another bar.
341	" 6....	"	"	..	"	M	29 Contused toes; taking ingot from machine, it fell on foot.
342	Mar. 1....	"	"	..	"	M	30 Contused side; turning a windlass, handle hit side.
343	" 2....	"	"	..	"	M	59 Broken large bone and dislocated ankle; ingot fell from mould.
344	" 3....	"	"	..	"	M	24 Contused hand; loading car of scrap, caught hand against side of car.

*Fatal.

ACCIDENTS FOR THE YEAR 1916.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 6—Continued.				
345	Mar. 2....	Canadian Steel Foundries, Ltd.	Welland.....	M	40	Finger jammed against side af car, while loading with pig iron.
385	" 9....	" " .. "	.....	M	26	Badly lacerated eye, loss of same; chipping lock, piece flew in eye.
387	" 3....	" " .. "	.....	M	20	Contused toe; was moving a mould when it fell over and hit foot.
[illegible]	" 8....	" " .. "	.....	M	26	Contused chest; pulling out a skull, when the hooks slipped off and fell.
[illegible]	" 14...	" " .. "	.....	M	26	Rib broken, and contused leg; struck with piece off vitrified revolving wheel and handle of grinding machine.
390	" 9....	" " .. "	.....	M	....	Contused finger; lifting shells and pinched fingers between two.
414	" 13....	" " .. "	.....	M	26	*Skull crushed; death in three minutes; eye of beam became detached from crane hook and same fell on head.
438	Jan. 17....	" " .. "	.....	M	45	Contused foot; dump car fell over and pinched foot.
435	Mar. 13....	" " .. "	.....	M	35	Contused foot; bottom plate of crane fell.
527	" 14....	" " .. "	.....	M	25	Contused leg; fell in a hole used for repairing cars.
528	" 28....	" " .. "	.....	M	28	Two fingers contused; caught between flask and box.
529	" 22....	" " .. "	.....	M	28	Contused leg; chain broke while drawing up a charge.
545	Apr. 6....	" " .. "	.....	M	19	First joint of little finger amputated, caught finger between links of chain when hooking chain on tray of shells.
546	" 7....	" " .. "	.....	M	35	Contused arm; emery wheel burst, piece struck him.
547	" [illegible]	" " .. "	.....	M	25	Head and shoulder bruised; digging trench, drawbar fell from passing car.
548	" 5....	" " .. "	.....	M	28	Ankle dislocated and finger, back bruised; fell from top ladle while cleaning scrap.
562	" 22....	" " .. "	.....	M	27	Hand infected; scratched on some steel.
563	" 21....	" " .. "	.....	M	49	Thumb lacerated and infected; hit with hammer.
564	" 23....	" " .. "	.....	M	26	Foot lacerated, stepped on a nail in board.
575	Mar. 21....	" " .. "	.....	M	26	Leg bruised; coming down from furnace, slipped off board and fell in hole.
576	Apr. 7....	" " .. "	.....	M	38	Foot bruised; piling angles with crane, pile rolled down and hit foot.
631	" 26....	" " .. "	.....	M	18	Finger lacerated; was making core, accidentally hit finger.

632	Mar.	22....	"	"	..	"	.....	M	28	Contused finger; loading pig iron, caught finger.
633	Apr.	24....	"	"	..	"	.....	M	38	Contused finger; pinched between two billets.
647	May	1....	"	"	..	"	.....	M	24	Three fingers cut; getting drawbar out of box, same slipped.
648	"	4....	"	"	..	"	.....	M	17	Arm broken; working in machine shop, slipped and fell.
649	"	9....	"	"	..	"	.....	M	23	Finger cut; mould stuck and cut finger.
650	"	6....	"	"	..	"	.....	M	30	Contusion of chest, left side and shoulder; leg bruised; a flask fell from pile.
651	Apr.	21....	"	"	..	"	.....	M	18	Wrist sprained; while carrying a bar it turned and sprained wrist.
701	May	13....	"	"	..	"	.....	M	26	Contusion of arm and shoulder; wrenched while using sledge hammer.
702	"	16....	"	"	..	"	.....	M	41	Leg cut by piece of slag.
703	"	14....	"	"	..	"	.....	M	50	Contusion of back; fell against bolt on cab.
704	"	6....	"	"	..	"	.....	M	26	Contusion of hand; while pulling moulds on planer, string broke, and block fell.
705	"	18....	"	"	..	"	.....	M	21	Three fingers lacerated; caught between draw bars and floor.
706	"	9....	"	"	..	"	.....	M	52	Little finger badly cut by shears.
711	"	26....	"	"	..	"	.....	M	19	Top of finger cut off while attempting to fix flask on machine.
712	"	11....	"	"	..	"	.....	M	30	Burned on top of feet by bar of hot steel.
713	"	25....	"	"	..	"	.....	M	36	Leg cut by small drift while punching hole in steel.
745	"	26....	"	"	..	"	.....	M	25	Foot burned by molten steel.
746	"	31....	"	"	..	"	.....	M	24	Contusion of foot; mould fell.
747	"	16....	"	"	..	"	.....	M	26	Abrasion and contusion of foot; piece of scrap fell.
748	"	15....	"	"	..	"	.....	M	36	Piece of steel fell on foot.
749	Feb.	8....	"	"	..	"	.....	M	42	Body, legs and arms burned by molten steel.
750	May	14....	"	"	..	"	.....	M	21	Laceration of toe; shaking out moulds on shells, one dropped on foot.
788	June	3....	"	"	..	"	.....	M	29	Burns on leg and testicle; hot bar hit some obstacle on floor and bounced.
789	"	1....	"	"	..	"	.....	M	20	Fingers lacerated; jammed between crate and ingot.
790	May	31....	"	"	..	"	.....	M	20	Two fingers lacerated; mould fell and hit hand.
791	June	16....	"	"	..	"	.....	M	32	Steel bar fell on leg and broke fibula.
792	"	12....	"	"	..	"	.....	M	24	Cuts and bruise on cheek near eye; tongs from plate slipped from crane.
793	"	13....	"	"	..	"	.....	M	18	Fingers lacerated; caught between wheel and centre plate.
794	May	26....	"	"	..	"	.....	M	22	Hot car fell on foot and burned it.
795	June	15....	"	"	..	"	.....	M	49	Slight abrasion and contusion of leg; crushed between rolls in rolling mill.
852	"	21....	"	"	..	"	.....	M	24	Struck on forehead by hook, cutting scalp.
853	"	22....	"	"	..	"	.....	M	20	Knuckle fell off pile and bruised toe.

*Fatal.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 6—Continued				
854	May 31....	Canadian Steel Foundries, Ltd.	Welland	M	33	Burns on foot; molten steel splashed from ladle.
944	July 7....	" "	"	M	28	Ruptured side while lifting mould.
945	" 14....	" "	"	M	34	Burns on fingers infected from heat of tongs and bars.
946	June 19....	" "	"	M	33	Infected right hand; injured in rolling mill.
976	July 24....	" "	"	M	25	Piece of steel flew from machine and gashed wrist.
977	" 21....	" "	"	M	17	Piece of rail slipped off chain on crane, cutting leg; contusion of big toe.
995	Aug. 9....	" "	"	M	33	Eyes injured while turning plugs on lathe.
1015	July 24....	" "	"	M	23	Burned back of neck, right ear and shoulder by bar from rolls.
1016	May 28....	"	"	M	46	Side of face, left arm and shoulder lacerated; cut by rough edge of shell blank while reaching over machine.
1017	Aug. 9....	" "	"	M	39	Deeply cut on right leg by piece knocked off billet.
1018	" 11....	" "	"	M	35	Displaced cartilage of knee while unloading load of brick.
1027	" 14....	" "	"	M	....	End of machine blew off lacerating below left breast.
1028	" 17....	" "	"	M	27	Fell on hot bar burning right arm.
1119	" 28....	" "	"	M	21	Piece of steel flying from machine cut leg.
1120	" 30....	"	"	M	17	Ends of fingers caught in gears and crushed.
1121	" 29....	" "	"	M	29	Forehead cut by piece of steel from shears.
1122	" 12....	" "	"	M	40	Hook on chain slipped, cutting thumb off at joint.
1123	Sept. 6....	" "	"	M	31	Smashed end of fingers while working on planer, piece of steel fell.
1124	" 3....	" "	"	M	22	Contusion of side by falling piece of steel from shears.
1125	" 5....	" "	"	M	31	Leg bruised by flying piece of steel.
1126	" 7....	" "	"	M	26	One finger broken; hand slipped while holding chisel.
1127	" 8....	" "	"	M	20	Hole punched in hand while ramming cores.
1173	" 22....	" "	"	M	43	Sprained ankle by stepping on scrap.
1174	Aug. 17....	" "	"	M	27	Arm cut; steel fell over.
1175	Sept. 15....	" "	"	M	20	Foot bruised; crane slipped and box of scrap fell.
1277	" 14....	" "	"	M	46	Shoulder bruised; hook slipped off roll.
1176	" 19....	" "	"	M	54	Finger smashed while hooking chain on car.
1177	" 17....	" "	"	M	20	Fingers cut; caught hand on box.
1179	Aug. 29....	"	"	M	27	Two cuts on finger; finger caught in box while hooking chain.
1203	Sept. 28....	" "	"	M	62	Leg cut; steel fell.
1204	" 11....	" "	"	M	30	Leg cut and bruised; electric crane ran on leg.
1239	" 23....	" "	"	M	22	Leg bruised; mould swung round while being hooked.

1272	Oct.	6....	"	"	..	"	.....	M	25	Finger cut and foot bruised; eye beam stick broke while carrying it.
1273	"	11....	"	"	..	"	.....	M	37	Toe bruised; piece of scrap fell.
1274	"	10....	"		..	"	.....	M	24	Finger smashed; hook slipped while raising crane box.
1275	"	15....	"	"	..	"	.....	M	45	Finger smashed; caught under bar of steel.
1276	"	11....	"	"	..	"	.....	M	27	Foot burned; piece hot slag fell in shoe.
643	.....		Canadian Elect. Mchy.	Westinghouse		Hamilton.....		M	....	First finger off at third joint; caught while operating turret lathe.
756	May	26.....	"	"	..	"	.....	M	24	Arm bruised; transformer lever fell.
757	June	3.....	"	"	..	"	.....	M	31	Elbow bruised; fell from ladder.
758	May	30....	"	"	..	"	.....	M	29	Finger lacerated and contused; caught between file and shell.
759	"	30....	"	"	..	"	.....	M	38	Contused laceration over eye; wrench flew out of lathe.
771	June	12....	"	"	.		.....	M	32	End of first finger, left hand, taken off at bone; caught finger under press.
812	"	15.....	"	"	.	"	.....	M	17	Nail torn off finger; brushed away cuttings with hand.
813	"	19.....	"	"	.	"	.....	M	42	Abdomen bruised; fell with keg of resin.
882	"	14....	"		..	"	.....	M	32	Piece of steel flew from lathe into eye.
883	"	19....	"		.	"	.....	M	35	Scratch on hand became septic from copper turnings.
901	"	29....	"		.		.....	M	33	Foot contused; shell fell off truck.
915	"	30....	"		..		.....	M	53	Contused laceration of forehead and forearm; stone fragments from grinder struck him.
951	July	10....	"		..	"	.....	M	33	Toe bruised; casting fell off drill table.
952	"	15....	"		..	"	.....	M	37	Sand in eyes, opened hand hole before shutting off air pressure.
1004	Aug.	5....	"		..	"	.....	M	40	Left finger swollen and inflamed; sliver of steel ran into finger.
1005	"	14....	"		..	"	.....	M	24	Nails torn off, first and second right fingers, while oiling shafting, tried stopping machine with plank.
1006	"	17....	"		..	"	.....	M	46	Shoulder hurt while removing rotor from stator it overbalanced, throwing him.
1007	"	4.....			..	"	.....	M	27	End off right thumb; hooking slings to casting, caught his thumb between slings and casting.
1008	"	14.....	"		..	"	.....	M	25	Hand and forearm scalded; shell truck tipped, to stop from falling put out hand and it went into hot water tank.
1009	"	8.....	"		..	"	.....	M	28	Third left finger fractured; packing pump in boiler house, one side pressure not released causing plunger to stroke, catching finger.
1057	"	19....	"		..	"	.....	M	55	Thumb point lacerated and dislocated at first joint; caught between wrench and tool holder.

*Fatal.

ACCIDENTS FOR THE YEAR 1916.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 6—Continued				
1058	Aug. 19....	Canadian Westinghouse Elect. Mchy.	Hamilton.....	M	....	Big toe bruised; drilling 16" non-pressure head when it slipped and fell on toe.
1059	" 21....	" ..	"	M	25	Piece of steel in right eye; while filing piston head, piece of steel from file entered eye.
1060	" 22....	" ..	"	M	25	Compound fracture forefinger; caught between turret.
1061	" 14....	" ..	"	M	19	Blood poisoning; scratched ear trying to get piece of brass out with piece of wood.
1062	" 22....	" ..	"	F	18	Point of thumb taken on above joint; operating circular saw.
1180	Sept. 18....	" ..	"	M	28	Nail torn off finger; caught between casting and parallel block.
1181	" 18....	" ..	"	M	40	Nail torn off; shell fell against finger.
1182	" 19....	" ..	"	M	47	Top right finger crushed; caught between bar and cross carriage of lathe.
1183	" 21....	" ..	"	M	38	Big toe bruised; shell fell on foot.
1290	Oct. 11....	" ..	"	M	44	Bruised abdomen and fracture lower ribs; hand feed milling machine caught clothing.
1291	" 11....	" ..	"	M	56	Two fingers contused and lacerated; caught between bed of lathe and bar.
1195	" 4....	" ..	"	M	28	*While driving auto truck was struck by G.T.R. freight train.
1301	" 17....	" ..	"	M	23	Foot burned by hot metal.
1	Nov. 2....	Canadian Yale & Towne, Ltd., Locks	St. Catharines....	M	43	First finger, right hand severed at first joint; caught finger between stripper and edge of knob base on kick press.
19	" 17....	" ..	"	F	20	Loss of two fingers to base of nail while operating bench power press.
90	" 26....	" " ..	"	M	15	Index fingers caught between punch and tube and flesh taken off.
284	Feb. 10....	" " ..	"	M	32	Slight concussion of brain, overcome by naphtha; fell striking head on brick floor.
384	Mar. 6....	" " ..	"	M	32	Thumb ground while grinding butt knuckles.
513	Apr. 4....	" " ..	"	M	16	Portion of flesh and nail off finger.
616	" 28....	" " ..	"	M	32	Two toes crushed; 100-lb. case of hardware slipped on foot.
617	" 24....	" " ..	"	F	18	Fingers caught in punch; skin and nail torn.

627	May	10	"	"	.....	"	.....	F	17	Caught previously injured finger on nail in bench, re-opening wound.
736	June	17	"	"	.....	"	.....	M	16	Thumb deeply cut while operating lathe.
772	"	8	"	"	.....	"	.....	M	36	Centre of left eye struck by piece of brass while removing steel from brass socket.
848	July	3	"	"	.....	"	.....	M	35	Badly burned by molten metal, which exploded.
997	Aug.	15	"	"	.....	"	.....	F	15	Nail broken and flesh torn from side of finger; caught under punch.
1168	Sept.	20	"	"	.....	"	.....	M	....	Hand cut and bruised; hand slipped off shifter and came in contact with belt.
1207	Sept.	30	"	"	.....	"	.....	M	36	Foot burned by molten metal; struck ladle against mould.
1248	Oct.	13	"	"	.....	"	.....	F	30	Flesh and part of finger crushed on stamping machine.
92	Dec.	8	Chadwick Brass Co.		.....	Hamilton	.....	M	....	Finger severely cut.
136	"	21	"	"	.....	"	.....	M	....	Smashed two fingers while removing spindle from lathe.
900	July	14	Albert Cox.		.....	St. Catharines.	..	M	....	Foot injured by mou'ding falling on it.
7	Nov.	8	Dain Mfg. Co.		.....	Welland	.....	M	30	Index finger lacerated trying to stop disc from revolving with hand instead of wood post.
47	"	22	"	"	.....	"	.....	M	....	Nail bruised caught under hammer of rotary riveting machine.
58	"	26	"	"	.....	"	.....	M	....	Hand cut while putting belt on pulley.
59	"	27	"	"	.....	"	.....	M	....	Index finger cut; caught between two hoppers.
97	Oct.	2	"	"	.....	"	.....	M	....	Knuckles bruised while grinding cast iron, came in contact with grinding surface.
						"	.....	M	....	
112	Dec.	11	"	"	.....	"	.....	M	....	Finger and wrist bruised, while boring block, chuck became loose bruising hand.
142	"	29	"	"	.....	"	.....	M	....	Knuckle cut; caught hand under boring bit.
143	"	27	"	"	.....	"	.....	M	....	Fell and cut hand on piece of gravel.
144	"	28	"	"	.....	"	.....	M	....	Screw driver slipped cutting finger.
184	Jan.	5	"	"	.....	"	.....	M	....	Cut palm of hand on edge of disc.
185	"	4	"	"	.....	"	.....	M	....	Palm of hand torn by piece of wire while catching falling discs.
186	"	11	"	"	.....	"	.....	M	....	Finger bruised on emery wheel; guiding scrapers, hand slipped.
187	"	11	"	"	.....	"	.....	M	....	Fingers cut on boring machine.
188	"	5	"	"	.....	"	.....	M	....	Scratched finger on wire while bundling single discs.
189	"	....	"	"	.....	"	.....	M	....	Hand gashed; coming in contact with rip saw.
190	"	10	"	"	.....	"	.....	M	....	2nd finger at 1st joint injured while taping hubs for disc fingers.
252	"	29	"	"	.....	"	.....	M	....	Ran piece of glass in foot; slipped on ice while shutting doors.
213	"	27	"	"	.....	"	.....	M	....	2nd finger right hand bruised; while grinding castings hand slipped.
199	"	20	"	"	.....	"	.....	M	....	Finger bruised while grinding scrapers; hand slipped.
198	"	18	"	"	.....	"	.....	M	....	Two fingers cut on Emery wheel.

*Fatal.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 6—Continued				
253	Jan. 21....	Dain Mfg. Co.	Welland	M	....	Palm of left hand cut while cutting discs.
254	" 4....	" "	"	M	....	Ran piece of wire in left hand; catching falling discs.
255	" 5....	" "	"	M	....	Palm of left hand cut while setting up disc.
256	Feb. 3....	" "	"	M	....	Thumb of left hand bruised while driving casting on to arm.
257	" 1....	" "	"	M	....	Hand came in contact with saw while squaring rims for wheel.
258	" 1....	" "	"	M	....	Piece of steel run into 2nd finger; assembling scrapers for drills.
273	" 9....	" "	"	M	....	Finger bruised, chisel slipped and hammer struck finger.
274	" 8....	" "	"	M	....	Cut finger on piece of steel while drilling pipe.
275	" 5....	" "	"	M	....	Knuckle bruised; hand slipped on machine.
323	" 25....	" "	"	M	....	End of first finger left hand split with hammer while riveting spreader aprons.
324	" 26....	" "	"	M	....	Finger cut on scraper.
325	" 29....	" "	"	M	....	Skin cut on 2nd finger left hand; handling bundles of iron scraps.
326	Mar. 1....	" "	"	M	....	Finger of right hand pinched; raking beater head off spreader.
327	Feb. 29....	" "	"	M	....	Forehead gashed, cutting small artery; flying scrap slug struck him.
328	Mar. 1....	" "	"	M	....	Big toe split and nail loosened; 75 lb. bar dropped while unloading rolled steel.
436	" 25....	" "	"	M	....	End of finger mashed; shut car door on it.
464	" 29....	" "	"	M	....	Finger of left hand bruised; casting broke driving boots on disc.
839	Feb. 18....	" "	"	M	....	Piece of wire in palm of hand.
21	Nov. 10....	Dominion Steel Foundry. ..	Hamilton.	M	25	Head cut and hand bruised; box fell from platform.
22	" 12....	" " " ..	"	M	37	Wrist bone broken in two places; struck by blade from machine.
45	" 3....	" " " ..	"	M	21	Finger cut; casting fell on hand.
46	" 6....	" " " ..	"	M	60	Finger split; ingot slipped.
63	" 25....	" " " ..	"	M	40	Foot bruised; ingot slipped.
95	" 24....	" " " ..	"	M	23	Foot bruised; ingot slipped on it.
96	" 30....	" " " ..	"	M	33	Face and arm burned by small explosive in furnace.
114	Sept. 26....	" " " ..	"	M	22	Struck in eye by piece of steel.
115	Dec. 15....	" " " ..	"	M	24	Finger cut; casting fell on it.

116	Nov. 27....	"	"	"	..	"	.....	M	21	Foot bruised by falling shell.
117	Dec. 9....	"	"	"	..	"	.....	M	20	Arm caught between ingots and small bone fractured.
118	" 3....	"	"	"	..	"	.....	M	22	Face and arm burned by back draft on furnace.
139	" 23....	"	"	"	..	"	.....	M	48	Finger crushed; hit with sledge by helper.
140	" 24....	"	"	"	..	"	.....	M	34	Leg cut; struck by piece of steel from test.
141	Sept. 26....	"	"	"	..	"	.....	M	35	Eye pierced by small piece of steel.
170	Jan. 6....	"	"	"	..	"	.....	M	32	Arm broken; air tank exploded and fell.
261	Dec. 23....	"	"	"	..	"	.....	M	40	Blood poison; ran nail in hand while handling flasks in foundry.
288	Jan. 27....	"	"	"	..	"	.....	M	40	Thumb sprained by falling steel.
289	Feb. 8....	"	"	"	..	"	.....	M	23	Hand and wrist badly squeezed betwen iron bucket and car.
330	" 22....	"	"	"	..	"	.....	M	43	Broken finger; ingot fell on same.
484	Mar. 4....	"	"	"	..	"	.....	M	21	Crushed foot; iron box fell.
485	Feb. 29....	"	"	"	..	"	.....	M	22	Face and three fingers of left hand burned; throwing oil waste into furnace.
530	Mar. 28....	"	"	"	..	"	.....	M	30	*Skull crushed; hit on head with block from crane.
531	" 24....	"	"	"	..	"	.....	M	36	Right side of head cut with shovel handle.
532	" 16....	"	"	"	..	"	.....	M	50	Left palm cut while lighting piece of slag.
533	" 31....	"	"	"	..	"	.....	M	....	Bone broken over instep; lost balance causing him to turn ankle while handling iron bar.
534	" 21....	"	"	"	..	"	.....	M	25	Large toe bruised and cut; dropped box on it.
535	" 22....	"	"	"	..	"	.....	M	20	Large left toe cut and bruised; ingot slipped out of hand.
536	" 14....	"	"	"	..	"	.....	M	29	Loss of fleshy top and bone of index finger; caught in chain.
537	" 11....	"	"	"	..	"	.....	M	55	Ruptured on right side by lifting barrel of benzine.
538	" 21....	"	"	"	..	"	.....	M	23	Finger end and nail crushed while handling castings.
539	Feb. 29....	"	"	"	..	"	.....	M	30	Right leg amputated above knee; crushed by car jumping track pinning leg against floor.
565	Mar. 25....	"	"	"	..	"	.....	M	31	Thumb cut; lost balance working on scaffold.
566	" 27....	"	"	"	..	"	.....	M	44	Index finger punctured while handling ingots.
567	" 25....	"	"	"	..	"	.....	M	60	Crushed right foot; turned to blood poison, skin dropped.
568	" 8....	"	"	"	..	"	.....	M	20	Portion of flesh off three fingers while handling castings.
569	Apr. 17....	"	"	"	..	"	.....	M	14	Right thumb contused and part of nail torn away; grinding stamp in emery wheel it slipped.
637	" 25....	"	"	"	..	"	.....	M	30	Hands, arms and face burned; floor settling in tempering room, gas pipe snapped, struck match to light pipe causing explosion.
638	" 31....	"	"	"	..	"	.....	M	25	Flesh torn from end of finger while lifting pig iron.
639	" 30....	"	"	"	..	"	.....	M	20	Index finger split and hand bruised; setting roller in lathe room, roller slipped.
680	" 8....	"	"	"	..	"	.....	M	22	Top of right foot bruised; ingot fell.
681	Mar. 31....	"	"	"	..	"	.....	M	42	Left middle finger and nail contused and infected; caught in chain from electric box.

*Fatal.

ACCIDENTS FOR THE YEAR 1916.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 6—Continued				
682	Apr. 20....	Dominion Steel Foundry ...	Hamilton	M	44	Right hip, leg and shin scraped; taking furnace door from truck, frame slipped.
683	May 13....	" " " ..	"	M	20	Finger badly torn; caught in chain of electric crane.
684	Apr. 29....	" " " ..	"	M	35	Ulcerated eye, got steel in eye while grinding tools.
685	May 12....	" " " ..	"	M	32	Toe crushed; clutch fell off drill press.
709	" 7....	" " " ..	"	M	....	Hand lacerated by piece of steel from car.
741	Apr. 3....	" " " ..	"	M	38	Toe amputated; crushed by skid slipping off angle iron.
742	May 11....	" " " ..	"	M	24	Finger ends crushed; firing up core ovens drew poker back too far and struck cement wall.
743	May 13....	" " " ..	"	M	20	Foot pierced by slipping on piece of shell.
777	" 30.....	" " " ..	"	M	22	Right 3rd and 4th fingers broken and torn, climbing over small cars; crane man acidentally jarred cars, catching between bogie on cars.
823	" 26....	" " " ..	"	M	26	Heel burned; hot metal splashed from ladle.
824	June 18....	" " " ..	"	M	19	Leg cut; fell on cutting from ingot.
825	May 17....	" " " ..	"	M	22	Back bruised; lost balance and fell from car.
826	June 10....	" " " ..	"	M	39	Fingers crushed; while loading shells on skid.
840	Feb. 13....	" " " ..	"	M	22	Blood poisoning from cut on palm from tool.
850	June 3.....	" " " ..	"	M	....	Finger crushed; ingot fell on it.
876	May 23....	" " " ..	"	M	25	Contused wound on ball of thumb; chipping casting, hammer struck thumb.
877	July 5....	" " " .	"	M	28	Index fingers cut by piece of scrap.
895	June 11....	" " " .	"	M	30	Finger cut; repairing drive shaft, guard fell on finger.
899	" 12....	" " " .	"	M	47	Shin cut; ingot fell from skid.
1095	Aug. 22....	" " " ..	"	M	30	Loss of half of finger; caught in chain while hooking scrap on to chain.
1096	" 21....	" " " ..	"	M	38	Front of left leg lacerated; shifting flasks, one fell.
1128	" 29....	" " " ..	"	M	22	Eye cut while turning bars on lathe, piece of steel flew from bar.
1129	" 23....	" " " ..	"	M	41	Fell and strained back.
1130	" 31....	" " " ..	"	M	27	Eye cut; piece of steel flew while operating cut off machine.
1190	Sept. 16....	" " " ..	"	M	28	Moulding box dropped on toe, taking off nail.
1191	" 3....	" " " ..	"	M	32	Tips of fingers lacerated; struck fingers while putting ingot into machine.
1192	" 12....	" " " ..	"	M	27	Contusion of back; handle of bucket fell over.

1193	Aug. 4....	"	"	" ..	"	M
1194	Sept. 12....	"	"	" ..	"	M
1237	" 8....	"	"	" ..	"	M
1238	July 15....	"	"	" ..	"	M
1292	Aug. 29....	"	"	" ..	"	M
1293	Sept. 7....	"	"	" ..	"	M
1294	" 29....	"	"	" ..	"	M
1302	" 25....	"	"	" ..	"	M
1303	" 12....	"	"	" ..	"	M
618	May 4....	Geo. Edgington.		Brownsville.		M
197	Jan. 14....	Electro Metals Ltd.		Welland.		M
1053	Aug. 31....	" "		"		M
553	Apr. 14....	Frost Wire Fence Co.		Hamilton.		M
1240	Oct. 2....	Goodyear Tire & Rubber Company.		Bowmanville.....		M
1255	" 10....	Goold Shapley & Muir Co. ..		Brantford.		M
214	Jan. 25....	Grand Trunk Ry. Co.		Welland.		M
3	Nov. 2....	Greening Wire Co.		Hamilton.		M
64	" 30....	" "		"		M
171	Jan. 4....	" "		"		M
172	" 10....	" "		"		M
308	Feb. 21....	" "		"		M
437	" 19....	" "		"		M
462	Mar. 20....	" "		"		M
677	May 12....	" "		"		M
798	June 16....	" "		"		M
846	Feb. 23....	" "		"		M
880	June 6....	" "		"		M
881	July 5....	" "		"		M
1196	Oct. 2....	" "		"		M
1288	Oct. 20....	" "		"		M

26	Palm of hand cut; board flew out of ripsaw, put hand on saw in stepping out of way.
40	Two fingers amputated; caught in gears of cutoff machine.
29	Contusion of toe; while taking ingots out of oven, hook fell.
32	Index finger cut; jammed between ingot and machine.
21	Arm and face burned; while swabbing press, oil splashed.
39	Leg bruised and cut; skid of crane swung back.
38	Finger badly infected; got steel slivers from shell.
28	Thumb fracture; pig iron fell on it.
30	Finger infected; hand touched belt and cut finger.
....	Thumb and three fingers cut. 3rd finger amputated at 1st joint; cut on large circular saw while removing dust from between splitter and saw.
34	*Skull fractured; electrode and holder fell on him.
38	*Right arm taken off at shoulder, left arm at elbow, head crushed, was drawn into conveyor mechanism.
34	*Caught in wire block and carried around, head striking on plate stand.
45	Thigh scalded by steam from exhaust pipe.
56	*Killed; caught in line shaft of gas engine.
27	Left eye injured; while cutting portion of plate with chisel, piece of steel penetrated eye.
....	Abrasion to eyeball; stooping over bundle of wire, end sprang up.
20	Arm lacerated; caught between rope machine and guard.
40	Eyeball cut; end of wire slipped out of coil.
23	Loss of 1st joint of 3rd and 4th fingers; slipped and put out hand to save himself, getting caught in machinery.
18	Arm broken near wrist; putting belt on machinery while in motion.
58	*Scratched arm on piece of wire; blood poisoning.
66	Cut across palm of right hand while oiling loom.
44	Broken blood vessel, caught foot in some scrap and fell.
....	Thumb and finger crushed; one amputated; caught between beater and loom frame.
32	Arm dislocated and severely lacerated while taking arm off block, arm caught on another revolving at side.
19	Two fingers bruised; caught between pulley and belt.
46	Abrasion of finger; blood poisoning developed later; cleaning oil hole draw point slipped and struck finger.
....	Palm cut; hand caught in loom.
....	Arm sprained; sleeve caught in coiler of spooling machine.

*Fatal.

ACCIDENTS FOR THE YEAR 1916.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 6—Continued				
1289	Oct. 23....	Greening Wire Co.	Hamilton	M	49	Wrist cut; caught between belt and pulley.
740	May 26....	Hamilton Stamp & Stencil Co.	"	F	18	Loss of end of index finger; closed dies without removing finger.
5	Nov. 2....	Hamilton Stove & Heater Co.	"	M	53	Ribs fractured; fell down elevator shaft.
113	Dec. 9....	" " " ..	"	M	30	Finger lacerated; hand slid under clutch on lathe.
687	May 29....	" " " ..	"	M	42	Index finger cut while trucking scrap.
849	June 17....	Hampel Paper Box Co.	Brantford.	M	....	End of thumb crushed in ending machine.
916	" 26....	Electric Welded Chain.	St. Catharines. .	M	....	Injured shoulder; fell pulling over bundles of wire.
6	Nov. 8....	Electro Steel & Metals Ltd.	Welland.	M	30	Bruised thumb and hand; caught hand while putting belt on pulley.
721	June 7....	Harvey Knitting Co.	Woodstock.	M	60	*Fell down elevator shaft.
722	June	" "	"	F	....	Two fingers crushed; slipped and grasped machine in motion.
807	June 23....	" "	"	F	....	End of finger cut off while cutting knit goods.
1010	Aug. 17....	" "	"	M	....	Thumb crushed on knitting machine.
48	Nov. 19....	Hay & Co. Ltd.	"	M	....	Fingers lacerated and top of left thumb taken off.
93	Dec. 8....	" "	"	M	....	Fractured arm; fell off lumber pile.
434	Mar. 21....	" "	"	M	....	Side of foot gashed; slipped off car.
435	" 27....	" "	"	M	....	Left hand lacerated; on buzz planer.
512	Apr. 8....	" "	"	M	....	Three fingers lacerated.
1014	Aug. 22....	" "	"	M	....	Right thumb severed; cut in veneer clipper.
676	May 17....	" "	"	M	....	Right eye injured; struck by piece of wood from circular saw.
744	June 9....	" "	"	M	....	First finger cut by ripsaw.
510	Apr. 11....	Hewson & Farrell.	Grimsby.	M	....	Ends cut off two fingers while feeding small chopper.
914	July 17....	Homer & Wilson	Hamilton.	.....	14	End of fingers crushed slightly.
147	Dec. 11....	International Harvester Co.	"	M	45	Contused ribs; horse ran away and threw him into side of cart.
148	" 15....	" " ..	"	M	45	Lacerated finger; truck twisted and caught fingers.
149	Nov. 9....	" " ..	"	M	30	Foot burned by molten metal.
150	Dec. 4....	" " ..	"	M	22	Both nails torn out by stock bending upwards and jamming fingers.
151	" 3....	" " ..	"	M	33	Fingers lacerated by swing saw.
152	Nov. 30....	" " ..	"	M	27	Fingers lacerated; caught between drill frames.
153	" 27....	" " ..	"	M	36	Palm of hand wounded; struck hand against mower frames

154	" 6....	"	" ..	"	M	45	Hand burned by molten metal while catching iron at furnace.
155	" 14....	"	" ..	"	M	40	Fracture and severe contusion of thumb; caught between handle of poker and iron wheelbarrow.
468	Jan. 7....	"	" ..	"	M	30	Laceration and contusion of 3rd finger; caught under seed boxes.
469	" 12....	"	" ..	"	M	17	Severe bruises over body and leg sprained; caught pants in revolving shaft.
470	" 21....	"	" ..	"	M	16	Part third finger amputated; shearing stock.
471	" 22....	"	" ..	"	M	23	Back of left leg burned; hot metal splashed.
472	" 27....	"	" ..	"	M	23	Incised second finger; became infected.
473	Feb. 12....	"	" ..	"	M	17	Three fingers severely lacerated while working on saw.
474	" 14....	"	" ..	"	M	17	Right palm severely lacerated; piece of wood thrown from circular saw.
475	" 15....	"	" ..	" ...	M	30	Nail torn out of left 2nd finger by twisting a truck.
476	" 23....	"	" ..	"	M	31	Right leg burned; carrying ladle of iron, some splashed out.
477	Jan. 29....	"	" ..	"	M	35	Fracture of molar bones and severe laceration of side of face.
478	Mar. 1....	"	" ..	"	M	21	Right heel burned; metal splashed out of ladle.
479	Feb. 29....	"	" ..	"	M	24	Back of right hand blistered by heat from ladle.
480	" 25....	"	" ..	"	M	23	Contusion of back of right hand; key of die in drop hammer came loose and fell.
481	" 16....	"	" ..	"	M	41	Foot and heel burned; metal splashed from ladle.
482	Jan. 10....	"	" ..	"	M	31	Severe contusion of left leg; flask fell.
483	Mar. 6....	"	" ..	"	M	28	Laceration of second left finger while countersinking discs.
541	" 24....	"	" ..	"	M	38	Severe sprain foot and ankle; jammed under loaded truck.
542	" 31....	"	" ..	"	M	34	Finger tips amputated; replacing shaft into rattler, pinch bar slipped.
543	" 30....	"	" ..	"	M	35	Scald down forearm; hot water splashed from pail.
544	" 28....	"	" ..	"	M	32	Foot burned; hot metal splashed from ladle of workman.
597	Apr. 18....	"	" ..	"	M	28	Right leg and foot burned; metal splashed from ladle.
598	" 14....	"	" ..	"	M	30	Contused right leg, arm and side by falling stock.
628	" 25....	"	" ..	"	M	25	Contused second right finger, nail torn out; finger caught by rollers of saw.
629	" 21....	"	" ..	"	M	21	Nail torn out and contusion of large left toe; run over by loaded truck.
630	May 1....	"	" ..	"	M	35	Contusion of large right toe; binder platform slipped from grasp.
726	" 27....	"	" ..	"	M	40	Strained muscles of leg while dumping barrow of coal.
727	" 31....	"	" ..	"	M	40	Fingers lacerated while setting up canvas machine.
728	" 12....	"	" ..	"	M	15	Infected hand; punctured hand on rusty piece of casting.
907	June 27....	"	" ..	"	M	27	Loss of portion of finger; caught by gear and torn.
908	" 27....	"	" ..	"	M	33	Contusion and fracture of second metatarsus; frame fell out of flask.

*Fatal.

ACCIDENTS FOR THE YEAR 1916.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 6—Continued				
909	July 13....	International Harvester Co..	Hamilton	M	23	Fell down hold of vessel and fractured right clavicle.
910	" 10....	" " ..	"	M	34	Back burned by molten metal.
1222	Sept. 26....	" " ..	"	M	34	Contused knee; thrown from cart and wheel passed over leg.
1223	Aug. 22....	" " ..	"	M	38	Laceration of cornea and contusion of eye.
1224	Sept. 8....	" " ..	"	M	40	Arm punctured by piece from broken punch.
1225	" 18....	" " ..	"	M	19	Amputated tip of index and fractured second finger while operating sheet metal press.
1226	" 22....	" " ..	"	M	28	Contused toe; wheel of truck ran over foot.
1227	Aug. 17....	" " ..	"	M	36	Burned on foot by hot metal.
1228	" 21....	" " ..	"	M	31	Severe incised wound on hand; striking knife on block to straighten it.
1229	" 18....	" " ..	"	M	63	Right hand contused and lacerated while repairing and fixing sluice door.
1230	" 21....	" " ..	"	M	45	Sprained wrist and contused hip by being thrown off handle of ladle down to floor.
1231	July 31....	" " ..	"	M	32	Severe laceration of index finger while grinding stock.
1279	Oct. 11....	" " ..	"	M	24	*Found dead; supposed to have fallen forward on machine while changing dies.
1256	" 10....	J. Johnston.	Brantford.	M	53	*Killed by blow over heart from mixer.
465	Mar. 14....	Laidlaw Bale Tie Co.	Hamilton.....	M	....	Finger cut off; caught between wire block and wire, block accidentally started.
466	" 22....	" " "	"	M	....	Struck in eye by nail; shaking down keg of nails, keg struck nail in floor.
467	Feb. 28....	" " "	"	M	....	Arm broken; fixing belt, hand caught between belt and shaft.
1257	Sept. 20....	Lincoln Paper Mills Co.	Merritton.	M	25	Blood poisoning; result of abscess.
1258	" 29....	" " " ..	"	M	41	Blood poison; cut knuckle at second joint resulting in blood poisoning.
411	Mar. 11....	McKinnon Chain Co.	St. Catharines. .	M	....	Tips taken off fingers while operating 4-slide forming machine.
551	Apr. 8....	" "	" ..	M	....	Thumb split open trying to take out rings jammed in automatic welder.
679	May 11....	" "	" ..	M	....	Finger partly crushed under power cutting press.
723	" 31....	" "	" ..	M	....	Struck in eye by piece of steel.
49	Nov. 13....	Malcolm & Souter	Hamilton.	.....	....	Finger lacerated; came in contact with boring machine.
134	Dec. 8....	" "	"	M	....	Cut finger in nail which resulted in blood poisoning.

626	May	6....	Massey Harris Co.			Brantford.		M	24 End of finger crushed; caught on stripper plate of multiple punch.
725	June	3....	" "			"		M	35 End of thumb crushed; piece of pig iron fell from truck.
768	"	9....	" "			"		M	58 Cracked rib trying to remove fly wheel of press with crow bar.
805	"	14....	" "			"		M	20 Flesh wound on finger; drill caught and revolved the guard around.
888	July	7....	" "			"		M	25 Caught finger while pulling milling facer into its holder.
905	June	27....	" "			"		M	19 Ends of fingers slightly injured; came in contact with sandpaper.
906	July	10....	" "			"		M	56 Thumb bruised by end of belt.
957	"	27....	" "			"		M	23 End of index finger slightly injured; caught under stripper plate of punch.
1056	Aug.	25....	" "			"		M	25 Point of thumb cut off; cutting material for crates.
1081	Sept.	5....	" "			"		M	36 Back of hand came in contact with bar and sliver of steel ran into it.
1232	Oct.	2....	" "			"		M	18 Arm and side bruised; clothing caught in drill.
1233	"	2....	" "			"		M	17 Drill went through nail and end of thumb when putting jig on face plate.
1234	"	5....	" "			"		M	21 Wrench slipped and jammed finger.
1235	"	3....	" "			"		M	20 Thumb crushed between dies; stepped back to let truck pass.
1236	"	5....	" "			"		M	28 Fleshy part of hand punctured; caught between machine and spindle.
1262	"	14....	" "			"		M	38 Hand and fingers torn; truck struck end of load.
1263	"	14....	" "			"		M	34 Finger crushed; handle of crane caught and flask hit hand.
1295	"	20....	" "			"		M	.... Finger cut; placed hand in front of binder knife which was being tested.
1300	"	24....	" "			"		M	59 Toe lacerated; let mould fall.
922	July	12....	Mercury Mills Ltd.			Hamilton.		M	11½ Head caught between counterbalance and door of elevator; three teeth knocked out.
1115	Sept.	13....	Metal Drawing Co.			St. Catharines. .		M	.... Four fingers taken off right hand on punch press.
1206	"	22....	" "			" ..		M	.... Foot crushed; while press was being disassembled.
20	Nov.	6....	Morrow Screw & Nut Co. ..			Ingersoll		M	18 Ends of fingers taken off on punch press; tripped press before removing hand.
4	"	5....	" " " ..			"		M	17 Tore nail off thumb on press; accidentally caught foot and punch came down.
18	"	6....	" " " ..			"		M	21 Arm twisted while putting belt on pulley with a stick.
135	Dec.	14....	" " " ..			"		M	*15 Finger cut and bone scraped; while changing twist drill put hand under mill cutter.
204	"	11....	" " " ..			"		M	44 Bundle of steel fell off car and bruised toe.
212	Jan.	26....	" " " ..			"		M	18 Nail off left thumb, pressing primer discs tripped press too quickly.

*Fatal.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DIVISION No. 6—Continued				
290	Feb. 10....	Morrow Screw & Nut Co. ...	Ingersoll	M	25	Portion of second finger taken off on press.
321	" 15....	" " " ..	"	M	35	Two ribs fractured; standing on work box which tipped.
322	Mar. 4....	" " " ..	"	M	50	Right forearm broken in two places; attempted to throw belt off counter shaft without stopping shaft.
827	June 15....	" " " ..	"	M	55	While putting runway on car, let it slip on instep.
828	" 19....	" " " ..	"	M	16	Hand injured on saw.
829	" 9....	" " " ..	"	M	15	While putting screw in machine, it revolved carrying finger under saw.
878	" 30....	" " " ..	"	M	19	Part of nail and fleshy end of finger taken off on punch.
879	" 26....	" " " ..	"	M	23	Thumb badly bruised; caught between frame of machine and set screw.
1011	Aug. 16....	" " " ..	"	M	14	Right finger mangled; putting bars in cutting off machine, caught finger in gear.
1052	" 28....	" " " ..	"	M	20	Cut right arm; reaching across machine, operator's sleeve caught.
1208	Sept. 26....	" " " ..	"	M	14	Top of finger cut; hand slipped off drill.
1280	" 25....	" " " ..	"	M	43	Elbow cut while taking shrapnel socket off arbor.
1281	Oct. 16....	" " " ..	"	M	46	Finger taken off at first joint; caught between revolving stock and framing tool.
169	Dec. 13....	Morton & Sons Ltd.	Hamilton.	M	....	Ran nail in palm of hand.
23	Oct. 15....	National Steel Car Co.	"	M	27	Deep cut on thumb; hand slid on steel.
24	" 11....	" " "	"	M	31	Ruptured side while helping to lift furnace.
25	" 21....	" " "	"	M	21	Lacerated cut on finger; greasing motor on transfer table while in motion.
26	" 25....	" " "	"	M	21	Struck by hot chip from lathe and eyelids burned.
27	" 30....	" " "	"	M	23	Bar of steel rolled on foot and bruised toe.
28	Nov. 5....	" " "	"	M	40	Leg bruised; struck by angle iron.
39	Sept. 13....	" " "	"	M	37	Badly bruised; bar slipped and he fell off platform.
38	" 10....	" " "	"	M	38	Poisoned hands; dipped in solution.
39	" 18....	" " "	"	M	29	Arm cut; pedie broke off.
40	" 22....	" " "	"	M	30	Two fingers bruised; caught between iron and log.
41	" 28....	" " "	"	M	20	Right foot bruised; reamer fell off car.
42	Oct. 6....	" " "	"	M	25	Burn on eye by hot rivet.
43	" 8....	" " "	"	M	27	Side bruised and two ribs fractured; slipped off car.
44	" 11....	" " "	"	M	25	Fell against sill and cut head.
66	Nov. 15....	" " "	"	M	22	Cut elbow; struck against machine.
67	" 19....	" " "	"	M	24	Thumb bruised; caught between countersink and washer.

68	"	16....	"	"	"	...	"	.....	M	32	Foot injured; stepped on nail.
69	"	13....	"	"	"	....	"	.....	M	38	Bruised ankle while moving industrial track.
70	"	15....	"	"	"	....	"	.....	M	25	Hand punctured by piece of sledge hammer.
71	Oct.	25....	"	"	"	....	"	.....	M	20	Burns on eyelid by hot chips from lathe.
72	Nov.	23....	"	"	"	....	"	.....	M	38	Foot cut by shell bar.
73	Oct.	26....	"	"	"	....	"	.....	M	40	Cheek bruised; nose cut by die from air hammer.
111	Dec.	2....	"	"	"	....	"	.....	M	....	Head cut; contusion of right leg and left chest; fell off platform.
129	"	5....	"	"	"	....	"	.....	M	....	Cut muscles; bruised shoulder; put arm around drill.
130	"	8....	"	"	"	....	"	.....	M	48	Head cut; shoulder grazed; lever on shell furnace slipped and struck him.
131	"	15....	"	"	"	....	"	.....	M	45	Palm cut; putting on bolt against burr.
132	"	15....	"	"	"	....	"	.....	M	20	Toes crushed; under car frame.
133	"	15....	"	"	"	....	"	.....	M	24	Foot cut and bruised; closed car door against it.
145	"	17....	"	"	"	....	"	.....	M	....	Three fingers cut; caught in large sliding.
146	"	16....	"	"	"	....	"	.....	M	52	Fell off ladder and cut leg; nose and hip bruised.
176	"	27....	"	"	"	....	"	.....	M	29	Loss of sight; got piece of steel from tool in eye which became infected.
177	Jan.	6....	"	"	"	....	"	.....	M	58	Contusion of eyeball and orbit; taking drink of water slipped on handle.
178	"	6....	"	"	"	....	"	.....	M	35	Contusion of face, arm and body; sleeve caught in drill.
179	Dec.	16....	"	"	"	....	"	.....	M	30	Punctured wound; septic—, by chip from shell.
272	Jan.	28....	"	"	"	....	"	.....	M	....	Portion of finger taken off; on corner of cutting machine.
291	Feb.	2....	"	"	"	....	"	.....	M	52	Finger crushed under drill.
292	Jan.	25....	"	"	"	....	"	.....	M	30	Foot bruised; shell fell.
293	"	29....	"	"	"	....	"	.....	M	26	Side bruised; car side slipped on crane.
294	"	28....	"	"	"	....	"	.....	M	23	Cut finger; caught between die and car frame.
295	"	26....	"	"	"	....	"	.....	M	28	Finger cut; while chalking painting machine.
296	"	13....	"	"	"	....	"	.....	M	35	Foot bruised; steel strap fell.
297	Sept.	24....	"	"	"	....	"	.....	M	24	Burned thumb with hot scale; septic.
298	Dec.	31....	"	"	"	....	"	.....	M	23	Knee bruised; struck by piece of swinging steel.
299	Jan.	15....	"	"	"	....	"	.....	M	25	Toes cut; let journal box lever fall on foot.
337	Feb.	7....	"	"	"	....	"	.....	M	25	Right hand punctured; struck hand against nail in block.
338	"	25....	"	"	"	....	"	.....	M	35	Bruised head, chest and chin, slight shock; fell from electric car.
392	Mar.	10...	"	"	"	....	"	.....	M	37	Thumb and wrist cut; hand caught when cleaning pulley.
393	Jan.	8....	"	"	"	....	"	.....	M	27	Lead poisoning; poisoned on cars newly painted.
394	Mar.	4....	"	"	"	....	"	.....	M	26	Cut right thumb; caught between rest and thumb.
395	Feb.	2....	"	"	"	....	"	.....	M	40	Internal hemorrhage from injury to stomach.
396	"	18....	"	"	"	....	"	.....	M	15	Back strained; handling truck load of shells.
397	"	23....	"	"	"	....	"	.....	M	40	Top finger crushed; nail off; caught between bolt and machine.
398	"	9....	"	"	"	....	"	.....	M	21	Lead poisoning; working on cars newly painted.
399	Jan.	3....	"	"	"	....	"	.....	M	27	Lead poisoning; working on cars newly painted.
400	Mar.	4....	"	"	"	....	"	.....	M	45	Cut large toe; moving journal box, it rolled off board.

ACCIDENTS FOR THE YEAR 1916.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DIVISION No. 6—Continued				
412	Mar. 16....	National Steel Car Co.	Hamilton.....	M	34	Burned left and right forearms and fingers by gasoline torch.
413	" 13....	" " "	"	M	24	Feet sprained; fell pulling car door down on crane contrary to instructions.
463	" 17....	" " "	"	M	28	Top of finger crushed, amputated at first joint; let furnace grate fall.
519	Apr. 8....	" " "	"	M	34	Right arm amputated between wrist and elbow; placing guard on trimming press while in motion.
520	Mar. 30....	" " "	"	M	45	Upper arm badly cut; sleeve caught in gear of lathe.
521	" 21....	" " "	"	M	47	Thumb punctured (septic), from wood sliver.
522	" 23....	" " "	"	M	27	Finger bruised; struck with hammer.
523	" 25....	" " "	"	M	20	Working on sleeping car as fitter; dust lodged in eye.
524	" 27....	" " "	"	M	48	Three toes crushed, one fractured; let shell fall.
577	Apr. 13....	" " "	"	M	25	Deep cuts on fingers; trying to remove shell shaving, caught in chuck.
578	" 11....	" " "	"	M	53	Right wrist strained; fell on piece of iron.
579	" 6....	" " "	"	M	27	Cut two fingers; caught between pot and press.
580	" 17....	" " "	"	M	29	Cuts on hands; drill caught in hole and threw dog against hand.
581	" 12....	" " "	"	M	33	Cuts on fingers; circular saw threw piece of wood against hand.
582	" 12....	" " "	"	M	28	Right foot strained; stepped on board.
583	" 14....	" " "	"	M	28	Eruptions on back of hand from previous injury.
584	" 19....	" " "	"	M	27	Deep cut, right thumb; steel slipped on truck.
585	" 16....	" " "	"	M	23	Right finger cut; caught under underframe.
586	" 15....	" " "	"	M	....	Thumb cut under falling shell.
587	" 15....	" " "	"	M	28	Right thumb cut; struck by steel shaving.
588	" 10....	" " "	"	M	....	Right foot punctured; stepped on nail.
619	" 18....	" " "	"	M	35	Hand cut; handling electric grinder, machine grounded, shock caused it to fall.
620	" 1....	" " "	"	M	25	Cut base of finger; struck against punch.
621	" 26....	" " "	"	M	....	Two fingers cut; welding piece of iron, blacksmith burned it quickly and struck hand.
622	" 17....	" " "	"	M	33	Left thumb cut, septic; punctured by wood sliver.
623	" 26....	" " "	"	M	24	Bad cut, left finger; nail off, bar slipped and let steel fall.
624	" 20....	" " "	"	M	29	Right foot punctured; stepped on nail in board.

625	"	27....	"	"	"	....	"	.....	M	28	Dislocated arm at shoulder; swung off locomotive.
652	"	26....	"	"	"	....	"	.....	M	38	Eyes burned by back fire from furnace.
653	May	4....	"	"	"	....	"	.....	M	22	Leg below knee cut by flying piece of iron from steam hammer.
654	"	4....	"	"	"	....	"	.....	M	57	Left foot badly bruised; fracture metacarpal bone; let steel bar fall.
655	"	3....	"	"	"	....	"	.....	M	32	Top of right thumb crushed; bar slipped.
656	"	1....	"	"	"	....	"	.....	M	30	Top second finger cut; shell cut-off saw fell on finger.
657	Apr.	28....	"	"	"	....	"	.....	M	37	Back of hand burned; shell upset letting hot resin strike hand.
658	"	25....	"	"	"	....	"	.....	M	58	Foot bruised; let leg of wheelbarrow down on foot.
659	"	26....	"	"	"	....	"	.....	M	25	Cut on finger; struck hand against casting.
688	May	18....	"	"	"	....	"	.....	M	....	Thumb bruised; fracture of metacarpal bone; while moving wheel of machine, same fell on hand.
717	"	16....	"	"	"	....	"	.....	M	....	Eye cut; fell over rope on floor.
718	"	13....	"	"	"	....	"	.....	M	....	White lead poisoning.
719	"	26....	"	"	"	....	"	.....	M	....	Left foot bruised; piece of steel fell off truck.
720	"	25....	"	"	"	....	"	.....	M	19	Tips of fingers crushed; jack slipped and fell on fingers.
816	June	2....	"	"	"	....	"	.....	M	26	Finger cut; caught between bar and roof of car.
817	"	6....	"	"	"	....	"	.....	M	....	Toes bruised; let die drop.
818	"	7....	"	"	"	....	"	.....	M	35	Palm of hand crushed; placing piece of wood on stock on coping machine, when press came down.
819	"	12....	"	"	"	....	"	.....	M	30	Abdomen bruised; hammer forced bar up.
820	"	13....	"	"	"	....	"	.....	M	36	Hand cut; while placing bunk in sleeping car another came down.
833	"	24....	"	"	"	....	"	.....	M	37	Two fingers cut; die slipped out of hand.
834	"	24....	"	"	"	....	"	.....	M	34	Cut two fingers on wood block on shears.
835	May	20....	"	"	"	....	"	.....	M	40	Wood sliver punctured fingers; septic.
836	June	19....	"	"	"	....	"	.....	M	42	Side strained, handling heavy plank.
837	"	14....	"	"	"	....	"	.....	M	....	Thumb cut, touching emery wheel.
841	Feb.	7....	"	"	"	....	"	.....	M	26	Bar rolled off drill table and bruised toes.
842	"	7....	"	"	"	....	"	.....	M	33	Fell off dump car and cut head; also strained wrist.
891	June	28....	"	"	"	....	"	.....	M	22	Toes bruised; bench fell off shoulder.
892	July	4....	"	"	"	....	"	.....	M	30	Finger cut; caught in car door.
902	"	6....	"	"	"	....	"	.....	M	29	Finger cut; caught between iron baskets.
903	"	5....	"	"	"	....	"	.....	M	34	Arm bruised; sleeve caught in drill.
904	June	30....	"	"	"	....	"	.....	M	24	Finger cut, septic; caught between plate and press.
923	July	4....	"	"	"	....	"	.....	M	26	Finger bruised; struck against steel plate.
924	"	7....	"	"	"	....	"	.....	M	34	Bruised eyelid by chip from lathe.
925	"	7....	"	"	"	....	"	.....	M	35	Thumb cut; touched rip-saw.
926	"	9....	"	"	"	....	"	.....	M	35	Head and eyebrow cut; struck by block and tackle.
927	"	12....	"	"	"	....		.....	M	29	Thumb cut; struck hand against cutter while tightening nut.
928	"	17....	"	"	"	....	"	.....	M	22	Bruised foot; side sill fell off table.
929	"	17....	"	"	"	....	"	.....	M	20	Finger cut; slipped against grinding wheel.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DIVISION No. 6—Continued				
930	July 20....	National Steel Car Co.	Hamilton.....	M	35	Three toes badly crushed and one torn; while pushing truck, steel slipped and wheel struck foot.
958	" 22....	" " "	"	M	52	Hand cut on emery wheel.
959	" 25....	" " "	"	M	....	Scalp wounds, elbow and toe cut; plank on load of braces broke.
960	" 25....	" " "	"	M	34	Lacerations on scalp, ribs fractured, cuts and bruises; plank on load of braces broke.
961	" 28....	" " "	"	M	21	Finger cut, nail off; let bar fall.
962	" 28....	" " "	"	M	25	Foot burned; stepped in hole with hot water.
963	" 28....	" " "	"	M	28	Hand cut at base of thumb; pushed by another man.
964	" 28....	" " "	"	M	29	Finger amputated at second joint; touched lever on cut-off saw.
965	" 28....	" " "	"	M	37	Mouth cut, teeth out, finger also cut; handle on crane crank flew out.
1097	Aug. 11....	" " "	"	M	31	Foot bruised; shock from electric caused him to let drill fall.
1098	" 12....	" " "	"	M	36	Top of finger amputated; caught in crane chain.
1099	" 8....	" " "	"	M	44	Hand cut; struck it against pipe.
1100	" 8....	" " "	"	M	45	Cut and bruise on foot; let casting fall.
1101	" 4....	" " "	"	M	21	Elbow punctured; struck by piece of steel.
1102	" 5....	" " "	"	M	23	Bruised arm and head; thrown off wagon when horse jumped.
1103	July 31....	" " "	"	M	37	Strained back; lifting shell on to lathe.
1104	" 31....	" " "	"	M	56	Head and arms cut, ribs fractured; plank broke and piece of lumber fell.
1105	" 28....	" " "	"	M	36	Tops of fingers amputated; placed finger on anvil while another man was cleaning hammer.
1106	" 25....	" " "	"	M	28	Arm bruised; sleeve caught in reamer.
1107	Aug. 29....	" " "	"	M	25	Finger punctured by sliver of wood, septic.
1108	July 17....	" " "	"	M	29	Hand cut, septic; fell on oily plate.
1109	Aug. 27....	" " "	"	M	23	Thigh and arms bruised; caught by crane when moving belt.
1110	" 24....	" " "	"	M	22	Head cut and arm sprained; struck by live hose.
1111	" 22....	" " "	"	M	38	Toe cut; let crowbar fall.
1112	" 22....	" " "	"	M	25	Finger amputated; caught in coping machine.
1113	" 16....	" " "	"	M	22	Thumb cut; casting caught in emery wheel.

1114	" 12....	" " "	"	M	17	Shoulder, arm and neck bruised; loose shirt caught in drill.
1131	" 15....	" " "	"	M	24	Side bruised; while screwing cap on base, shell bar slipped.
1133	" 24....	" " "	"	M	25	Finger cut, hand and wrist sprained; key flew out.
1132	" 18....	" " "	"	M	24	Bruised finger while fixing coupling.
1134	" 24....	" " "	"	M	34	Finger bruised; let piece of iron fall.
1135	Sept. 1....	" " "	"	M	23	Hand cut; let piece of steel fall.
1136	" 1....	" " "	"	M	17	Top of finger cut; caught under die when placing it.
1137	" 1....	" " "	"	M	45	Top of finger taken off; caught between two shells.
1138	" 5....	" " "	"	M	21	Cut between toes; reamer broke and fell on foot.
1139	7....	" " "	"	M	26	Hand and face cut; jumped on bench which slipped and fell.
1241	" 14....	" " "	"	M	42	Foot cut; got under truck wheel.
1242	" 22....	" " "	"	M	24	Top of thumb crushed, nail off; touched trip of press.
1243	" 22....	" " "	"	M	29	Leg bruised; caught between trucks.
1244	Oct. 5....	" " "	"	M	21	Toes crushed; squeezed between door and truck.
1245	Sept. 20....	" " "	"	M	30	Burn on back of hand; touched hot pipe.
1246	" 28....	" " "	"	M	21	Finger and knee cut by piece of iron from drop hammer.
1247	" 17....	" " "	"	M	20	Finger crushed, nail off; let bar fall on hand.
1304	Oct. 16....	" " "	"	M	26	Sprained ankle; slipped on sidewalk.
1305	" 14....	" " "	"	M	23	Finger cut; caught between die and truck.
1306	" 7....	" " "	"	M	34	Eye inflamed; piece of dust flew from machine.
1307	" 21....	" " "	"	M	25	Top of finger crushed, bone fractured; hand ran into jointer when oiling it.
1252	" 12....	Sanitary Can Co.	Niagara Falls ...	F	40	Finger cut; clip dropped from chute.
191	Dec. 31....	Page, Hersey Iron Tube Co..	Welland.....	M	....	Foot sprained; caught in track.
192	Jan. 6....	" " "	"	M	25	Finger cut and bruised; tried to take paper out of fan while in motion.
193	" 2....	" " ..	"	M	....	Finger smashed; caught between lever of gas hopper and stop.
194	" 12....	" " ..	"	M	24	Compound fracture of leg; scarfing roll on edge of trench rolled on leg.
264	" 16....	" " ..	"	M	21	Thumb and fingers cut; placing coupling in machine, sliver caught hand.
285	Feb. 1....	" " ..	"	M	26	Finger lacerated; spindle came down catching fingers between spindle and coupling.
286	" 14....	" " ..	"	M	30	Fingers lacerated; caught in chain while lifting bundle of pipe.
287	" 9....	" " ..	"	M	26	Eye injured; got piece of turning in eye while milling dies.
319	" 9....	" " ..	"	M	26	Right side of head lacerated; opening pocket in coal car when lever sprang back.
320	" 23....	" " ..	"	M	....	Deep cut over pubis, also suffering from shock; struck in stomach by bar.

ACCIDENTS FOR THE YEAR 1916.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DIVISION No. 6—Continued				
440	Mar. 3....	Page, Hersey Iron Tube Co.	Welland.....	M	20	Fingers cut; became infected pushing pipe to machine, hand slipped and piece of pipe ran into finger.
441	" 13....	" " ..	"	M	22	Big toe, right foot badly smashed; changing weight on bender when it slipped and fell.
442	Feb. 9....	" " ..	"	M	30	Dislocated small bone in hand; piece of 8" pipe fell.
443	" 26....	" " ..	"	M	37	Hand bruised; pushing a hot 3" pipe, hand slipped and struck pipe.
444	Mar. 14....	" " ..	"	M	28	Left side bruised and swollen; pipe in ripper machine flew around and hit him.
589	" 20....	" " ..	"	M	28	Thumb badly bruised; holding chisel when man with sledge missed chisel and hit him.
590	Apr. 13....	" " ..	"	M	50	Right eye injured; trimming coupling when piece of same flew in eye.
591	" 15....	" " ..	"	M	33	Right foot bruised and swollen; pin dropped from buggy.
592	Mar. 22....	" " ..	"	M	27	Tip of thumb lacerated; cutting couplings on ripper, got thumb in gears.
593	Apr. 8....	" " ..	"	M	41	Third finger pulled off, 2nd amputated and little one twisted; put burlap on hands to protect them, loose end wound round pipe.
594	" 6....	" " ..	"	M	20	Hand cut while holding chisel.
595	" 9....	" " ..	"	M	50	Finger bruised; jammed between wheelbarrow of couplings and truck.
596	" 1....	" " ..	"	M	40	End of thumb and nail off; showing man how to fix pipe in tester, buggy was pushed back, catching thumb.
614	May 1....	" " ..	"	M	40	Thumb and two fingers lacerated on circular saw.
615	Apr. 5....	" " ..	"	M	25	Left eye injured; oiling hot saw when spark flew in eye.
640	May 11....	" " ..	"	M	....	Knee badly bruised and swollen; tripped and fell while carrying 10" ball.
641	" 11....	" " ..	"	M	32	Right arm, neck and face burned; dumping hopper in gas house when flame of gas puffed out, burning shirt.
646	Mar. 18....	" " ..	"	M	38	Lacerated thumb; working on shears when bundle of iron skelp fell.
690	May 14....	" " ..	"	M	54	Two fingers bruised and lacerated; jammed against post by crane.
691	" 15....	" " ..	"	M	30	Contusion of leg and burns; fell while pushing hot pipe to rolls.

692	" 8....	"	" ..	"	M	37	While lifting piece of iron off press, slipped and wrenched knee.
753	June 8....	"	" ..	"	M	29	Finger cut; screwing protector on end of pipe, cut on sharp edge.
754	" 6....	"	" ..	"	M	43	Finger bruised; spindle of tapping machine came down.
755	May 26....	"	" ..	"	M	....	Finger crushed; crushed between wrench and bed of boring machine.
806	June 23....	"	" ..	"	M	32	Finger bruised and lacerated; while moving plates, bar slipped.
809	" 9....	"	" ..	"	M	22	Elbow cut, infected; pipe fell off bench and end struck arm.
810	" 13....	"	" ..	"	M	42	Finger cut by sliver and became infected.
811	" 17....	"	" ..	"	M	30	Finger cut; trapped while fixing dies in threading machine.
843	Feb. 14....	"	" ..	"	M	20	Hand burned by hot pipe.
844	" 22....	"	" ..	"	M	22	End of finger lacerated; pipe fell.
845	Jan. 21....	"	" ..	"	M	21	Foot burned; piece of hot coupling iron fell.
889	June 28....	"	" ..	"	M	35	Hand bruised and lacerated; scaffold fell.
893	July 7....	"	" ..	"	M	32	Leg bruised and lacerated; engine of cars struck bundle of pipe which swung around.
894	" 7....	"	" ..	"	M	51	Toes bruised and lacerated; wheel of truck ran over foot.
912	" 18....	"	" ..	"	M	50	Finger burned by spark from furnace; later became infected.
969	" 19....	"	" ..	"	M	15	Leg lacerated by hot pipe.
970	" 25....	"	" ..	"	M	24	Fingers lacerated; slipped and iron ball fell on hand.
1054	Aug. 25....	"	" ..	"	M	45	Finger lacerated; driving pulley off shaft, jar of hammer loosened bearing, it came down on finger.
1079	Sept. 9....	"	" ..	"	M	44	Finger lacerated; got hand through wire guard of fan.
1080	" 1....	"	" ..	"	M	32	Right thumb fractured; pipe fell from bench, end flew up, striking hand.
1154	" 9....	"	" ..	"	M	28	Finger lacerated; caught in shears.
1163	" 16....	"	" ..	"	M	32	Ribs fractured, arm cut; chain of crane slipped on pipe, crushing him against car.
1212	Oct. 5....	"	" ..	.....	M	26	Fingers burned by hot tar; cleaning buggy, hand slipped into trough.
1299	" 20....	"	" ..	.....	M	22	Fingers lacerated; hand jammed between pipes.
1325	" 27....	"	" ..	.....	M	....	Right eyeball punctured; sledges struck together and chip flew into eye.
1326	" 26....	"	" ..	.....	M	24	Finger lacerated; loosening tap in machine, tap slipped and came down.
203	Jan. 5....	Patterson & Son Co.		Brantford.....	F	....	Elbow injured; slipped on stairs.
271	" 29....	"	"	"	M	....	One finger cut and one bruised; caught between rolls of mint machine.
956	Aug. 1....	Pilkington Bros., Ltd.		Thorold.....	M	39	Face cut, skull fractured; bar flew up, brushing him off platform.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DIVISION No. 6—Continued				
428	1916 ...	Pratt & Letchworth	Brantford.....	M	....	Right shin grazed; getting moulding sand out of bin, side fell out.
429	Jan. 22....	" " "	"	M	....	Foot burned; molten iron fell out of ladle.
430	" 18....	" "	"	M	....	Foot burned; molten iron splashed into shoe.
431	" 18....	" "	"	M	....	Finger squeezed; taking heavy casting out of moulds and piling them, one fell.
432	Feb. 8....	" "	"	M	....	Foot burned; molten iron fell from ladle of fellow workman.
433	Jan. 27....	" "	"	M	....	Severely burned; dipping iron from spout of furnace some splashed into shoe.
517	Apr. 4....	Pratt & Whitney Co.	Dundas.....	M	....	Finger cut; caught in milling cutter while brushing oil off ends of wave rib tools.
689	May 25....	" "	"	M	....	Toe cut; sheet of metal slipped off bench.
51	Nov. 10....	Proctor & Gamble	Hamilton.....	M	....	Fingers smashed; caught between two barrels.
52	" 18....	" "	"	M	....	Legs bruised; while hoisting iron plates which tipped over, was caught between floor and elevator.
283	Feb. 11....	" "	"	.....	....	While dumping stock into hot water, feet and hands burned.
331	Mar. 7....	" "	"	M	....	Leg scalded; stepped backwards into trap filled with hot water.
550	Apr. 18....	" "	"	M	....	Finger bruised and nail off; wind blew door shut and caught finger.
770	" 18....	" "	"	M	....	Stepped into some lye to shoe top.
776	June 15....	" "	"	F	....	Fingers and thumb pinched; pushing cans into machines, allowed hand to rest on roller feed which drew it in.
799	" 15....	" "	"	M	....	Back strained while pulling load away from machine.
814	" 21....	" "	"	M	....	Ankle injured; electric wire broke.
815	" 22....	" "	"	M	....	Fell, striking head, back and chest.
1025	Aug. 26....	" "	"	M	....	Elbow cut; while operating machine rested elbow on same, and hammer came down.
1026	" 25....	" "	"	M	....	Badly bruised arms and hands; drawn into conveyor while reaching for empty box coming down.
1076	Sept. 6....	" "	"	M	....	Finger cut off at nail; used finger to brush off piece of soap as press started.
1209	Oct. 3....	" "	"	M	....	Finger bruised; caught in cog wheel of wrapping machine.
1210	" 5....	" "	"	M	....	Bone in finger cut and flesh cut while cleaning engine.
17	Sept. 14....	Radigan & Co.	"	M	17	Four fingers taken off on stamping press.

335	Jan. 4	St. Catharines Machinery Co.	St. Catharines	F	16	Hands and legs burned; lacquer splashed on wires of electric toaster, igniting same; caught on clothing.
336	Dec. 22	" " ..	"	M	....	Lost first joint of index finger in small press.
887	July 10	Sanitary Can Co.	Niagara Falls	F	17	Loss of two finger tips; used fingers to push blanks out of die when machine started.
917	" 18	" "	"	F	....	Forearm penetrated by piece of steel from press shaft.
947	" 15	" "	"	M	36	Blood poisoning from scratch on hand.
948	Aug. 1	" "	"	F	19	Surface of index finger removed; put fingers in die, failed to remove them before press started.
966	" 2	" "	"	M	23	Wrist wrenched, hip bruised; jumped from flander and foot caught in rope.
1013	" 17	" "	"	M	21	Cut across left forearm; in passing load of plate, struck arm against plate.
1029	" 24	" "	"	M	....	Thumb cut while feeding tin plate through straightening machine.
1030	" 23	" "	"	F	....	Slight cut on finger became infected.
1051	" 24	" "	"	M	....	Right palm cut by trimming left in plate.
1164	Sept. 19	" "	"	M	35	Index finger nearly cut off; adjusting nailing machine, tripped machine while fingers were between nailing device and guides.
1169	" 22	" "	"	M	18	Broken finger; following defective can with hand, finger slipped between can and brace.
1308	Oct. 23	" "	"	M	18	Ankle sprained; slipped on ladder way.
94	Dec. 1	Semmens & Evel Casket Co.	Hamilton	M	40	Thumb cut on rip saw.
50	Nov. 1915	Simcoe Wool Stock Co.	Simcoe	M	....	End of finger pinched in pump.
318	Feb. 18	" "	"	M	....	Tips of fingers lacerated in teeth of picker.
460	Mar. 18	Smart Turner Machine Co.	Hamilton	M	....	Eyeball turned; chipping steel, piece flew into eye.
461	" 22	" " ..	"	M	41	Left eyeball cut; chipping casting, piece flew into eye.
1140	Sept. 13	" " ..	"	M	56	Arm cut and bruised; while operating lathe, arm was caught between crank throw and tool post.
1084	Aug. 22	Standard Steel Construction Co.	Welland	M	17	Arm badly cut; struck by chuck wrench in chuck when machine started.
1166	Sept. 12	" " ..	"	M	....	Bruised muscle in arm; while reaching under drill, sleeve caught.
1167	" 11	" " ..	"	M	....	Back strained; while lifting angles.
1254	" 26	" " ..	"	M	....	Thumb badly ground and nail off; punch slipped and hand caught on grinding wheel.
797	June 19	" " ..	"	M	....	Head cut; slipped and cut head on floor.
1155	Sept. 15	" " ..	"	F	....	End of forefinger pinched off at nail; piece of waste caught in gear when rubbing oil off hands.
1298	Oct. 21	" " ..	"	M	....	Toe crushed; counter-balance dropped on foot while releasing cover of insulating kettle.
317	Feb. 22	Stedman Bros.	Brantford	M	....	*Supposed to have fainted when started elevator and fell in such a position that he was caught by floor.

*Fatal.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DIVISION No. 6—Continued				
8	Oct. 28....	Steel Co. of Canada	Hamilton.....	M	28	Top of fingers taken off; rail turned over and caught hand.
9	Nov. 7....	" "	"	M	21	Nail off finger; while tightening bolt in fly wheel jammed in spanner.
10	" 4....	" "	"	M	32	Hand bruised; while placing safety guard on derrick, operator started machine.
11	" 2....	" "	"	M	28	Ribs hurt and back wrenched when moving rolls.
29	" 16....	" "	"	M	19½	Foot bruised; bar rolled on it.
30	" 2....	" "	"	M	28	Knee bruised; hit by sledge hammer.
31	" 7....	" "	"	M	29	Toe and nail bruised; billet fell on foot.
32	" 4....	" "	"	M	24	Finger caught by plates and nail taken off.
33	" 2....	" "	"	M	....	Foot bruised; while learning to draw wire got foot caught in rod.
34	Oct. 29....	" "	"	M	....	Arm and hands severely cut; ladder slipped and arm caught on edge of sheet iron cover of chain drive.
35	Nov. 1....	" "	"	F	15	Portion of finger taken off, cuts on joints of another; slipped and hand caught on cam.
36	Oct. 30....	" "	"	M	40	Ribs broken; fell against die stand.
53	Nov. 22....	" "	"	M	33	Foot bruised; bundle of rods fell on foot.
54	" 20....	" "	"	M	22	Slipped and struck head against corner of gear case of roll lathe.
55	" 22....	" "	"	M	18	Head, back and loins bruised; changing dies on press, scantling fell over, striking him.
56	" 20....	" "	"	M	18	Cut over eye; lifting scrap into dirt box, pick slipped.
74	Oct. 4....	" "	"	M	....	While trucking kegs of nails one rolled on foot.
75	Nov. 15....	" "	"	M	....	Rib fractured; taking bundle of wire off block was struck by pin of block.
76	" 15....	" "	"	M	....	Pulling boxes off truck when nail ran in finger.
77	" 11....	" "	"	M	35	Toe crushed; while moving machine, roller rolled on toe.
78	" 12....	" "	"	M	25	Palm of hand torn; caught on nail on tumblers.
79	" 25....	" "	"	M	....	Bar rolled on foot and bruised toe.
80	" 23....	" "	"	M	....	Foot badly bruised; piece of steel from shears fell on foot.
81	" 20....	" "	"	M	55	Nails of toe taken off; piece of iron fell on toe.
82	" 25....	" "	"	M	29	Two fingers crushed; let tubes of boiler fall.
83	" 4....	" "	"	M	....	Skin taken off wrist; bar twisted and caught hand rag.
84	" 29....	" "	"	M	23	Palm fractured; coupling engine and car, car ran back.
85	" 30....	" "	"	M	17	Finger lacerated; pulling spike out of tie, bar slipped.

86	"	25.....	"	"	.....	"	.....	M	24	Piece of scrap fell and cut hand.
87	"	25.....	"	"	.....	"	.....	M	....	Back wrenched; pulling on chain bars.
88	"	25.....	"	"	.....	"	.....	M	33	Knuckle bruised; struck hand against car.
89	"	29.....	"	"	.....	"	.....	M	41	Severed finger; caught in chain.
99	Dec.	1.....	"	"	.....	"	.....	M	34	Three fingers crushed; while cutting concrete wall, bar slipped and fingers jammed between bar and wall.
100	Nov.	26.....	"	"	.....	"	.....	M	33	Left groin severely strained; lifting timber.
101	Dec.	5.....	"	"	.....	"	.....	M	29	Legs bruised; in getting on foot board of engine, missed footing.
102	Nov.	25.....	"	"	.....	"	.....	M	40	Leg bruised; heavy casting was knocked over by waggon.
486	Mar.	27.....	"	"	.....	"	.....	M	32	Left forefinger nearly severed; cutting scrap on electric shears.
103	Nov.	17.....	"	"	.....	"	.....	M	40	Eye cut; while making spring for air compressor, piece of steel struck eye.
104	"	27.....	"	"	.....	"	.....	M	46	Top of finger cut; another man let brick fall.
105	"	29.....	"	"	.....	"	.....	M	21	Finger cut; caught in nail.
106	Dec.	7.....	"	"	.....	"	.....	M	21	Nail torn off finger; caught in chain while lowering scrap.
107	"	5.....	"	"	.....	"	.....	M	26	Body bruised; knocked down while unloading blowers from car.
108	"	6.....	"	"	.....	"	.....	M	45	Sprained arm; fell while pulling scrap in ladles.
109	"	4.....	"	"	.....	"	.....	M	50	Foot bruised; piece of steel bar fell.
110	Oct.	14.....	"	"	.....	"	.....	M	46	Top of index finger cut; while loading steel bars, hook caught fingers.
119	Dec.	11.....	"	"	.....	"	.....	M	44	Toe bruised; clamp fell on foot.
120	"	5.....	"	"	.....	"	.....	M	27	Toe bruised; hammer head flew off.
121	"	14.....	"	"	.....	"	.....	M	38	Cut over eye; piece of scrap fell from car.
122	"	10.....	"	"	.....	"	.....	M	28	Back strained while lifting shell bar.
123	"	20.....	"	"	.....	"	.....	M	47	Finger crushed; while piling steel blooms, dropped billet crop on hand.
124	"	13.....	"	"	.....	"	.....	M	22	Piece of ore fell on leg.
125	"	14.....	"	"	.....	"	.....	M	30	Foot bruised; piece of angle iron fell.
126	"	9.....	"	"	.....	"	.....	M	40	Lacerated finger; sliver from angle bar ran into it.
127	"	12.....	"	"	.....	"	.....	M	20	Ankle burned; leg slipped under slag from nozzle.
128	"	5.....	"	"	.....	"	.....	M	28	Saw frame slipped off support and cut tip off finger.
156	"	12.....	"	"	.....	"	.....	M	23	Foot punctured by nail while carting ore.
157	"	2.....	"	"	.....	"	.....	M	20	Instep burned; while breaking slag, piece flew into boot.
158	Nov.	8.....	"	"	.....	"	.....	M	....	Eye injured; while sharpening knife on emery wheel, steel flew into eye.
159	Oct.	20.....	"	"	.....	"	.....	M	39	Bruised toe; bar of scrap iron fell.
160	Nov.	17.....	"	"	.....	"	.....	M	58	Toe bruised; let crop end fall on foot.
161	"	25.....	"	"	.....	"	.....	M	17	Hand cut and bruised; loading buggy, bar rolled back.
162	"	30.....	"	"	.....	"	.....	M	....	Foot severely bruised; pushing buggy, wheel caught outside of foot.
163	"	5.....	"	"	.....	"	.....	M	42	Toe and fingers squeezed; bar slipped around.
164	Dec.	12.....	"	"	.....	"	.....	M	36	Toe bruised; sledge hammer fell off table.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DIVISION No. 6—Continued				
165	Dec. 15....	Steel Co. of Canada	Hamilton.....	M	33	Toe bruised; taking blooms from buggy, let one fall.
166	" 22....	" "	"	M	53	Index finger jammed; while charging furnace bar slipped from under bloom.
167	Nov. 29....	" "	"	M	41	Top of finger and nail pinched; caught finger between two bars.
168	Dec. 14....	" "	"	M	46	Back injured; while unloading wire off truck, one bundle fell.
180	" 18....	" "	"	M	....	Finger squeezed; handing down plank on crane, lever swung over.
181	" 11....	" "	"	M	51	Toe bruised; billet fell from pile.
182	Jan. 5....	" "	"	F	....	Hand torn and bruised; picked up tool from back of machine without stopping it, caught between cam and frame.
196	" 6....	" "	"	M	26	Instep bruised; bar rolled off buggy.
205	" 10....	" "	"	M	29	Leg jammed by wire flipper.
206	" 7....	" "	"	M	24	Struck in eye by piece of wire.
207	" 7....	" "	"	M	....	Hand cut and bruised; truck ran into post.
208	Oct. 10....	" "	"	M	43	Struck in eye by piece of steel.
209	Jan. 8....	" "	"	M	24	Thumb cut; shell fell.
210	" 4....	" "	"	M	22	Thumb torn; bloom slipped off buggy.
211	" 8....	" "	"	M	23	Nail torn off and finger squeezed by chain while unloading bridge plate.
215	" 28....	" "	"	M	32	Bruised right hand; caught underneath heavy piece of plate.
216	" 29....	" "	"	M	19	Right eye cut; shearing scrap in open hearth scrap yard, sliver of same lodged in forehead.
217	" 27....	" "	"	M	22	Cut three fingers, left hand, bruised foot and arm; tipped buggy of scrap on him.
218	Dec. 30....	" "	"	M	27	Bruised left foot; shell slipped from tongs fellow workman was carrying.
219	Jan. 10....	" "	"	M	28	Right thumb cut; loading box piles on buggy, struck thumb.
220	" 20....	" "	"	M	28	Leg burned near thigh; bar coming from roughing rolls turned round.
221	" 26....	" "	"	M	33	Concussion of brain; taking piece of steel from hammer, fellow workman let go tongs, man was thrown up and dropped heavily to ground.

222	"	12.....	"	"	.....	"	.....	M	30	Tip of finger burst; loading buggy with rounds, hand jammed between two rounds.
223	"	14.....	"	"	.....	"	.....	M	34	Ankles bruised; fixing lift for electric crane, lifting it from pile, bloom fell and struck ankles.
224	"	25.....	"	"	.....	"	.....	M	20	Cut two fingers, left hand; accidentally slipped fingers into saw when starting machine.
225	"	12.....	"	"	.....	"	.....	M	25	Two fingers mangled and one lacerated; caught in feed rolls of nail machine.
226	"	24.....	"	"	.....	"	.....	M	45	Bruised calf of leg; let billet fall.
227	"	9.....	"	"	.....	"	.....	M	36	Badly twisted ankle; foot slipped when moving steel roll along trough to saw.
228	"	23.....	"	"	.....	"	.....	M	45	Foot bruised across instep; feeding cold saw when bar dropped on foot.
229	"	14.....	"	"	.....	"	.....	M	22	Foot bruised and toe cut; got foot in front of wheel while pushing buggy.
230	"	14.....	"	"	.....	"	.....	M	30	Bruised left side; billets slipped causing him to fall.
231	"	14.....	"	"	.....	"	.....	M	25	Bruised right foot; billet fell on truck on foot.
232	Dec.	23.....	"	"	.....	"	.....	M	37	Right finger cut off at third joint; shifting gauge on bloom shears, caught between tilting table cylinder and gauge.
233	Jan.	20.....	"	"	.....	"	.....	M	25	Burned wrist; molten iron spurted out of furnace.
234	"	18.....	"	"	.....	"	.....	M	29	Bruised foot and big toe; unloading coal at coal hoppers, piece rolled on foot.
235	"	15.....	"	"	.....	"	.....	M	26	Bruised side; getting on engine, foot slipped allowing side to strike on cut of lever.
236	"	18.....	"	"	.....	"	.....	M	20	Badly bruised foot; loading pig iron, piece coming down chute struck him.
237	"	26.....	"	"	.....	"	.....	M	27	Injured right side; fell between box and buggy while stocking pig iron in scrap yard.
238	"	26.....	"	"	.....	"	.....	M	40	Bruised right foot; shearing scrap, a piece fell from shears.
239	"	26.....	"	"	.....	"	.....	M	45	Palm and back of hand badly torn and cut; oiling kicking gear of planer, gear caught hand.
240	"	26.....	"	"	.....	"	.....	M	26	Concussion of head; steel tongue of roll cart swung around and struck head.
241	Dec.	31.....	"	"	.....	"	.....	M	26	Right eye cut; large rock struck end of bar, causing other end to fly up.
242	"	31.....	"	"	.....	"	.....	M	34	Finger crushe; loading scrap in buggies, finger caught beneath some iron with raw edge.
243	"	27.....	"	"	.....	"	.....	M	55	Left leg cut; unloading car of magnesite, large rock rolled against leg.
244	"	29.....	"	"	.....	"	.....	M	20	Lacerated right hand; drawing out grate bars with tongs, fell striking bar he had drawn.
245	"	22.....	"	"	.....	"	.....	M	27	Nail off right toe; breaking up pig iron it glanced off block, striking toe.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DIVISION No. 6—Continued				
246	Dec. 26....	Steel Co. of Canada	Hamilton.....	M	21	Finger squeezed; adjusting tool on rest, tool tipped up pinching fingers.
247	" 29....	" "	"	M	25	Left heel cut; fell and wheel of buggy he was pushing caught heel.
248	" 31....	" "	"	M	32	Head cut; sledge flew from fellow workman.
249	Jan. 13....	" "	"	M	40	Left forefinger crushed; removing heavy lumber, caught finger between two pieces.
250	Dec. 11....	" "	"	M	46	Hand bruised and grazed and finger cut; stepped into slag pocket and fell against wall.
251	" 3....	" "	"	M	30	Little toe and side of foot bruised; caught foot between buggy and scale.
277	Jan. 25.....	" "	"	M	45	Neck and chest burned by hot metal.
278	Feb. 5....	" "	"	M	46	Foot bruised; stumbled over track rail.
279	Jan. 29.....	" "	"	M	30	Foot bruised while pulling buggy of pig iron.
280	" 27.....	" "	"	M	25	Bruised foot; pig iron fell.
281	Feb. 3...	" "	"	M	40	Head cut; while digging pipe trench, piece of timber fell.
300	" 8....	" "	"	M	25	Burst top of finger; loading buggy with steel billets.
301	" 3....	" "	"	M	43	Two fingers cut; struck hand against billets on buggy.
302	" 7.....	" "	"	M	29	Loss of top of finger; fixing chain for lift of steel, caught finger between chain and blooms.
304	" 2.....	" "	"	M	22	Elbow bruised; press broke and piece of punch struck elbow.
305	" 2.....	" "	"	M	29	Toe bruised; let plank fall.
306	" 8.....	" "	"	M	47	Finger broken; came in contact with drill.
312	Jan. 21.....	" "	"	M	....	Nail torn; finger jammed between fly wheel and bed of machine.
313	" 13.....	" "	"	M	40	Hand bruised; caught between iron truck and steel.
314	" 31.....	" "	"	M	....	Leg bruised; wire looped around foot.
346	Feb. 9.....	" "	"	M	21	Left leg bruised; breaking pig iron, piece struck leg.
347	" 9.....	" "	"	M	20	Bruised left foot; foot came in contact with wheel of car.
348	" 14.....	" "	"	M	40	Bruised left foot and groin; loading ore in barrow, piece rolled down from top.
349	" 9.....	" "	"	M	20	Body bruised, teeth loosened, chin cut; cover of oil extractor flew off.
350	" 18.....	" "	"	F	14	Severe cut and compound dislocation of finger; caught between frame of machine and moving cam.
351	" 22.....	" "	"	M	42	Two fingers crushed on press.

352	" 14....	"	"	.....	"	.....	M	....	Finger, right hand crushed; trapped fingers while pulling billets in wheelbarrow.
353	" 12....	"	"	.....	"	.....	M	47	Left foot badly bruised; let steel packing fall from planer.
354	" 18....	"	"	.....	"	.....	M	29	Cut wrist and bruised ankle; large plate of scrap flew from shears.
355	" 11....	"	"	.....	"	.....	M	43	Forehead cut; forging at steam hammer when tongs broke.
356	" 18....	"	"	.....	"	.....	M	32	Left foot badly bruised; piece of scrap fell from shears.
357	" 15....	"	"	.....	"	.....	M	34	First finger cut; changing blade in saw, frame fell off rack.
358	" 28....	"	"	.....	"	.....	M	22	Palm of hand cut badly; carrying billets, one slipped through hand.
359	Jan. 23....	"	"	.....	"	.....	M	25	Feet burned by cinder bursting.
360	Feb. 16....	"	"	.....	"	.....	M	24	Little finger, left hand cut slightly while loading blooms on buggy.
361	" 23....	"	"	.....	"	.....	M	26	Right eye injured; back end of wire flew up.
362	" 11....	"	"	.....	"	.....	M	22	Bruised thigh; handle of hammer slipped in his hand and struck him.
363	Mar. 3....	"	"	.....	"	.....	M	32	Slightly bruised, more shocked than injured; pushing out ingots, lost footing and fell into pit.
364	Feb. 27....	"	"	.....	"	.....	M	55	Bruised left foot; hooking up iron when hook failed to catch.
365	" 20....	"	"	.....	"	.....	M	24	Cut groin; fell off boiler and planks struck him.
366	" 10....	"	"	.....	"	.....	M	....	Left ankle burned; bars slid up against ankle when marking hot bars on hotbed.
367	" 18....	"	"	.....	"	.....	M	42	Fourth finger cut; carting pig iron from casting house to blast furnace.
368	" 28....	"	"	.....	"	.....	M	34	One finger broken, one badly crushed; cutting up bridge plate when one piece opened up on him.
369	" 18....	"	"	.....	"	.....	M	40	Left shoulder and arm bruised; fell from plank placed from car to pile.
370	" 15....	"	"	.....	"	.....	M	....	Badly cut toe, right foot; billet slipped off table onto foot.
371	" 3....	"	"	.....	"	.....	M	38	Joint of right knee torn; caught toe on stairs and fell.
372	" 25....	"	"	.....	"	.....	M	32	Big toe crushed; let end of bloom fall on foot.
373	" 8....	"	"	.....	"	.....	M	25	Leg burned; three bars dropped from hotbed into cradle, when taking piece of iron from hotbed.
374	" 19....	"	"	.....	"	.....	M	29	Finger crushed; caught between hook and pan of steel, which twisted.
375	" 15....	"	"	.....	"	.....	M	42	Bruised foot and toe; lifting box from angle straightener to pile, dropped it on foot.
376	" 9....	"	"	.....	"	.....	M	21	Smashed finger closing pocket of ore car, when wrench slipped.
377	" 6....	"	"	.....	"	.....	M	28	Right foot bruised; section of shrapnel bar slipped while being handled.
378	Mar. 3....	"	"	.....	"	.....	M	25	Foot bruised; ingots slipped from pile crushing foot against another ingot.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 6—Continued				
379	Feb. 2....	Steel Co. of Canada	Hamilton.....	M	45	Toes, left foot squeezed; loading forging, it slipped on toes.
380	" 26....	" "	"	M	36	Bruised eyeball; grinding piece of steel, piece flew in eye.
381	Mar. 3....	" "	"	M	44	Blow on wrist; holding bar for fellow workman, sledge missed bar and struck wrist.
401	Feb. 8....	" "	"	M	28	Two fingers crushed by chain on crane.
402	Mar. 6....	" "	"	M	21	Leg bruised; chain broke while loading machine with steel.
403	Feb. 10....	" "	"	M	30	Compound fracture of finger joint; handling scrap iron, piece fell on hand.
404	Mar. 6....	" "	"	M	20	Two fingers grazed and bruised; grinding off stud end of shrapnel blank which slipped and caught fingers.
405	" 13....	" "	"	M	41	Fracture first toe, right foot; piece of timber fell.
406	Feb. 29....	" "	"	M	38	Toe smashed; punch slipped from hand and fell on foot.
407	Mar. 9....	" "	"	M	20	Crushed right leg; caught between bumpers of cars.
408	" 11....	" "	"	M	31	Bruised left foot; picking up piece of scrap being sheared, shears caught in same.
415	" 6....	" "	"	M	37	Cut under left eye; cutting babbitt from bearing, piece flew up.
416	" 12....	" "	"	M	34	Right leg bruised slightly; unloading car of scrap iron.
417	" 17....	" "	"	M	65	Cut thumb and fingers; came in contact with saw.
418	Feb. 29....	" "	"	M	18	Right leg squeezed; wire caught on leg when he went to stop block.
419	Mar. 6....	" "	"	F	16	Contused wound of finger; required three stitches; removing planks from carrier of feeding machine.
420	" 13....	" "	"	M	25	Ankle badly bruised; carrying bars off scales, threw one off shoulder, when it rebounded.
421	Jan. 22....	" "	"	M	38	Small cut turned to blood poisoning; charging billets in furnace, when sharp edge cut finger.
422	Mar. 10....	" "	"	M	29	First joint, two fingers jammed off; caught in press.
423	" 10....	" "	"	M	32	Right palm torn; punching plates, sling slipped over cutting hand.
424	" 2....	" "	"	M	21	Side sprained; lifting a chill box, foot slipped.
425	" 9....	" "	"	M	23	Cut finger, right hand; working on annealing furnace, shell slipped in hand.
426	" 14....	" "	"	M	25	Left thigh cut; fell in ore chute.

427	"	14....	"	"	.....	"	.....	M	36	Fourth finger cut; hoisting smoke stack, it overbalanced and struck fingers.
445	"	23....	"	"	.....	"	.....	M	45	Left foot badly bruised; using steel hammer it glanced off.
446	"	19....	"	"	.....	"	.....	M	21	Right thumb badly torn; pushing ore buggy, large piece of ore fell.
447	"	20....	"	"	.....	"	.....	M	20	Foot bruised and first right toe; billet fell off saw bench.
448	"	15....	"	"	.....	"	.....	M	36	Right toe bruised; loading pig iron, piece slipped.
449	"	10....	"	"	.....	"	.....	M	24	Left ankle bruised; wind blew door shut, caught between door and steel bar.
450	"	20....	"	"	.....	"	.....	M	22	Foot badly bruised; piece fell off hack saw.
451	"	8....	"	"	.....	"	.....	M	36	Leg cut; shifting guard on emery wheel with axe, lead flew off and hit him.
452	"	20....	"	"	.....	"	.....	M	....	Two toes, right foot cut; piece of iron fell from wheelbarrow.
453	"	28....	"	"	.....	"	.....	M	27	Three fingers burned; heating can of black oil, can exploded.
454	"	16....	"	"	.....	"	.....	M	35	Right foot bruised; wheeling shell to furnace, it slipped off wheelbarrow.
455	"	16....	"	"	.....	"	.....	M	19	Sprained thumb; slipped and fell over shells.
456	"	18....	"	"	.....	"	.....	M	31	Bruised foot; taking trolley off main line.
457	"	21....	"	"	.....	"	.....	M	41	Bruised foot; rail fell.
458	"	18....	"	"	.....	"	.....	M	30	Bruised foot and cut toe; shell slipped.
459	"	21....	"	"	.....	"	.....	M	36	Thumb cut while handling rails.
487	"	29....	"	"	.....	"	.....	M	23	Foot burned; bundle billets burst, fell and burned foot to the bone.
488	"	24....	"	"	.....	"	.....	M	29	Cut forehead and broken nose; trying to pinch pot ahead with pinch bar which slipped and he fell.
489	"	23....	"	"	.....	"	.....	M	30	Bruised toes; drawing loaded buggy of ore when he slipped.
490	Apr.	1....	"	"	.....	"	.....	M	42	Fractured toe; foot caught between rail and ties.
491	Mar.	28....	"	"	.....	"	.....	M	30	Finger cut; caught on belt.
492	"	6....	"	"	.....	"	.....	M	....	Cut finger while working in cleaning house; blood poison set in.
493	"	10....	"	"	.....	"	.....	M	36	Bruised hip; projecting set screw caught in clothing.
494	"	18....	"	"	.....	"	.....	M	25	Finger cut; caught between wire block and wire plate.
495	"	10....	"	"	.....	"	.....	M	32	Leg bruised; caught between wire bench and wire reel.
496	Feb.	23....	"	"	.....	"	.....	M	....	Knee injured while cleaning wire in cleaning house.
497	Apr.	4....	"	"	.....	"	.....	M	22	Toe split stocking pig iron.
498	Mar.	28....	"	"	.....	"	.....	M	31	Badly bruised hand; changing rolls in steel mill, hand pinched by falling box.
499	"	25....	"	"	.....	"	.....	M	25	Arm burned; struck against hot shell.
500	Apr.	1....	"	"	.....	"	.....	M	23	Foot burned while tapping hole in furnace.
501	"	1....	"	"	.....	"	.....	M	28	Foot bruised and toe cut; making lift with crane, caught foot between steel in slinger and wooden ties.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No 6—Continued				
502	Apr. 3...	Steel Co. of Canada	Hamilton.....	M	36	Fractured thumb; pushing out billets reached too far in furnace, caught in roller.
503	" 3.....	" "	"	M	23	Toe cut; lifting piece of slag with crane, piece fell off.
504	" 5.....	" "	"	M	23	Head bruised, also leg and thigh; buggy turned over, knocking him down.
505	" 10.....	" "	"	M	22	Toe crushed; blank rolled off table on to foot.
506	Mar. 29.....	"	"	M	21	Fingers badly squeezed; man pushed bar of steel against his hand.
507	" 27.....	" "	"	M	31	Instep bruised; let piece of steel from hot saw drop.
508	Apr. 3.....	" "	"	M	33	Face badly burned; putting on fire, flame burst out from damper.
509	" 10.....	" "	"	M	30	Fingers cut; taking out scrap he fell across pile of billets.
555	" 10.....	" "	"	M	30	Bruised foot; lump of iron fell on foot.
556	" 6.....	" "	"	M	....	Finger came in contact with emery wheel while grinding shell blanks.
557	" 11.....	" "	"	M	42	Finger cut; loading skids from buggy, jagged edge of bloom caught finger.
558	" 15.....	" "	"	M	19	Fracture of metacarpus, left foot; slipped off while loading scrap.
559	" 3.....	" "	"	M	29	Left toe badly cut; grinding shell blanks, emery wheel burst, knocking guard off.
570	" 14.....	" "	"	M	20	Leg badly bruised; unloading scrap, piece turned over striking leg.
571	" 22.....	" "	"	M	29	Ankle sprained; fell while standing on plank at 700-ton press.
572	" 20.....	" "	"	M	22	Badly cut cheek (two stitches); hot billet struck under eye while taking hot steel from furnace.
573	" 17.....	" "	"	M	25	Cut large toe; dropped box of steel while removing from shears.
574	" 11.....	" "	"	M	29	Cut fingers and general shaking up; caught between wire and wire block.
599	" 15.....	" "	"	M	29	Toe crushed; foot slipped while pushing buggy load of steel bars.
600	" 26.....	" "	"	M	26	Top of finger torn with piece of scrap iron.
601	" 15.....	" "	"	M	49	Ribs bruised; while unloading shell, slipped between waggon and car.

602	"	19.....	"	"	.....	"	.....	M	18	Nail torn off finger; assisting to put bar of steel on hack saws, other man let go before hand was clear.
603	"	14.....	"	"	.....	"	.....	M	33	Foot badly bruised; billet rolled off buggy onto foot.
604	"	28.....	"	"	.....	"	.....	M	28	Sprained ankle; while walking between saws, turned over on ankle.
605	"	29.....	"	"	.....	"	.....	M	20	Bruised side; jammed with large piece of scrap while loading buggies.
606	"	23.....	"	"	.....	"	.....	M	42	Cut through left ear and head; piece of scrap flew from shears.
607	"	27.....	"	"	.....	"	.....	M	33	First finger badly crushed while loading car with shell blanks.
608	"	28.....	"	"	.....	"	.....	M	26	Finger crushed; rolling out shrapnel bars, trapped finger between bars.
609	"	21.....	"	"	.....	"	.....	M	19	Head bruised; removing tie with pick, missed and fell striking head on stove.
610	"	11.....	"	"	.....	"	.....	M	14	Finger pinched while shearing scrap.
611	May	1.....	"	"	.....	"	.....	M	38	Injured groin; sledge hammer struck against pumps they were erecting.
612	Apr.	22.....	"	"	.....	"	.....	M	33	Rupture; slipped while turning over billet.
613	"	28.....	"	"	.....	"	.....	M	22	Arm burned; while putting plug in cinder notch, red hot cinder flew up.
634	May	3.....	"	"	.....	"	.....	M	20	Hand badly cut on piece of plate with sharp edge.
635	"	10.....	"	"	.....	"	.....	M	37	*Head crushed; went between two castings, steel blocks fell, death was instantaneous.
636	Apr.	26.....	"	"	.....	"	.....	M	40	Ribs bruised; slipped while tightening lathe screw and fell against column.
642	May	11.....	"	"	.....	"	.....	M	22	Finger lacerated; assisting at shears when piece of scrap turned and caught hand.
660	Apr.	18.....	"	"	.....	"	.....	M	23	Instep slightly cut; bar of steel coming from hotbed rolled over foot.
661	"	27.....	"	"	.....	"	.....	M	69	Cheek badly cut; cutting scrap steel on steam shears, piece flew up.
662	May	4.....	"	"	.....	"	.....	M	32	Finger torn while hooking chain from crane, finger caught in chain.
663	"	15.....	"	"	.....	"	.....	M	35	Left eyelid lacerated; his mate let go piece of piping which flew up.
664	"	8.....	"	"	.....	"	.....	M	38	Left side bruised; broke through plank and thrown against press.
665	"	12.....	"	"	.....	"	.....	M	37	Bruised foot; while loading scrap on car, piece slipped from hands.
666	Apr.	24.....	"	"	.....	"	.....	M	25	Nail in right foot; stepped on piece of wood with upstanding nail.
667	May	19.....	"	"	.....	"	.....	M	47	Dislocated shoulder and elbow, fracture of left arm; struck on box of iron in quarrel with another man.

*Fatal.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 6—Continued				
668	May 17.....	Steel Co. of Canada	Hamilton.....	M	37	Head badly cut; unloading scrap from car, chain broke from crane.
669	" 15.....	" "	"	M	35	Arm broken; unloading car was struck by another engine.
670	" 13.....	" "	"	M	35	Back badly sprained; ground caved in while working under track.
671	" 18.....	" "	"	M	28	Bruised toe; large shell rolled from pile.
672	" 15.....	" "	"	M	46	Leg badly bruised; struck by bar of iron while unloading same.
695	" 16.....	" "	"	M	52	Hand burned while taking cable off ingot.
696	" 10.....	" "	"	M	37	Injured knee; lifting bundles of wire out of cleaning tub.
697	" 10.....	" "	"	M	21	Finger cut on loop of wire.
698	" 21.....	" "	"	M	50	Two toes bruised; adapter forging fell from pile.
699	" 10.....	" "	"	M	....	Motorcycle skidded, throwing him against gate post, breaking bone in foot.
700	" 22.....	" "	"	M	35	Foot bruised; while pulling pan buggies from "New Mills" one slipped.
708	" 27.....	" "	"	M	21	Bruised body and rupture of kidney; while cleaning crane, missed footing and fell.
714	" 29.....	" "	"	M	21	Leg fractured; loosening steel from crane it rolled over.
715	" 25.....	" "	"	M	47	Thumbs badly torn; caught between tongs and floor plate.
716	" 14.....	" "	"	M	53	Forearm cut; lost balance and fell against emery wheel.
730	" 30.....	" "	"	M	....	Finger cut and bruised; nail header came down on hand while removing bundle of wire from machine.
731	June 15.....	" "	"	M	26	Cut off second finger; placed hand on fan plate to stop machine; finger slipped into gear at back.
732	May 31.....	" "	"	M	30	Bruised knee and ankle; slipped on track.
738	" 31.....	" "	"	M	43	Finger joint broken and finger cut; hand caught with wire and drawn against block.
733	" 30.....	" "	"	M	35	Rib broken and side bruised; fell on plate which was edgeways up.
734	June 2.....	" "	"	M	32	Head cut; steel block fell from above.
735	" 1.....	" "	"	M	30	Leg bruised, cheek cut; steel stop block fell from overhead.
739	" 8.....	" "	"	M	19	Loss of third joint, second finger and thumb nail; hammer fell on hand.
760	" 8.....	" "	"	M	52	Side bruised; while loading car piece of pig iron fell.
761	" 6.....	" "	"	M	49	Ankle grazed by piece of scrap iron.
762	" 6.....	" "	"	M	26	Bruised finger between grate and fire bars, taking off nail.

763	May 27.....	"	"	.....	"	.....	M	26	Toe bruised; bar of steel dropped off buggy.
764	June 3....	"	"	.....	"	.....	M	40	Instep bruised; tongs fell.
765	May 31.....	"	"	.....	"	.....	M	37	Fingers squeezed while unloading car of steel billets.
766	" 30....	"	"	.....	"	.....	M	34	Toe bruised; steel bloom fell on foot.
769	" 11.....	"	"	.....	"	.....	M	38	Sore eye; piece of steel flew.
773	June 5.....	"	"	.....	"	.....	M	22	Left hand cut while putting blanks into furnace.
774	" 5.....	"	"	.....	"	.....	M	29	Fracture of left leg, No. 6 engine caught door lying on ground, wedging foot between door and oil tank.
775	" 8.....	"	"	.....	"	.....	M	21	Arm cut; struck by piece of angle iron while assisting at cold shears.
779	" 12.....	"	"	.....	"	.....	M	....	Right hand severely cut; clearing away chips allowed hand to go too far between frame of machine and revolving spindles.
788	May 12.....	"	"	.....	"	.....	M	21	Injured while operating bale tie machine.
781	June 7.....	"	"	.....	"	.....	M	22	Arm and back of head cut badly; putting on belt that had slipped off pulley, hand caught between belt and shaft.
782	May 19.....	"	"	.....	"	.....	M	41	Foot badly bruised; putting on truck load of wire, truck wheels ran on foot.
783	June 7.....	"	"	.....	"	.....	M	40	Sprained foot and shock; caught head on wires, shock knocked him off crane.
784	" 10.....	"	"	.....	"	.....	M	39	Bruised toes while lowering runner to place on furnace.
786	" 13.....	"	"	.....	"	.....	M	20	Wrist cut by piece of steel.
787	" 12.....	"	"	.....	"	.....	M	40	Split finger; packing valves on furnace, gland slipped.
800	" 19.....	"	"	.....	"	.....	M	28	Burned and bruised foot; while setting rounds on ground they slipped in chains.
801	Apr. 25....	"	"	.....	"	.....	M	35	Hernia.
802	June 20.....	"	"	.....	"	.....	M	19	Foot burned while hooking hot bars.
803	" 20.....	"	"	.....	"	.....	M	32	Crushed toe; while fixing rollers one ran over foot.
830	" 27.....	"	"	.....	"	.....	M	43	Cut toe back of nail; caught foot under edge of barrowful of sand.
831	" 25.....	"	"	.....	"	.....	M	25	Sprained and bruised knee; fell over piece of iron.
832	" 24.....	"	"	.....	"	.....	M	30	Bruised and cut toe; shrapnel billet fell from another man's shoulder.
855	" 14.....	"	"	.....	"	.....	M	....	Foot bruised; billet fell on foot.
856	" 30.....	"	"	.....	"	.....	M	26	Bruised foot; pin of guard rail fell out causing guard to fly open.
857	" 29.....	"	"	.....	"	.....	M	45	Door of car dropped and bruised ankle.
858	" 20.....	"	"	.....	"	.....	M	23	Skin broken on leg; tried to stop wire block by putting foot in loop.
859	July 3.....	"	"	.....	"	.....	M	31	Hand bruised; struck by piece of die which burst under steam hammer.
860	" 1.....	"	"	.....	"	.....	M	30	Toes bruised by piece of scrap from pile.
861	" 2.....	"	"	.....	"	.....	M	24	Severed artery in wrist; slipped and fell against window.
862	June 29.....	"	"	.....	"	.....	M	29	Badly burned hand; fell on hot rod from furnace.
863	July 7.....	"	"	.....	"	.....	M	22	Toe bruised; blank fell.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DIVISION No. 6—Continued				
864	Sept. 21.....	Steel Co. of Canada	Hamilton.....	M	42	Thumb badly bruised and top torn; got between guard and billet.
865	" 19.....	" "	"	M	23	Burned on left leg; shovelling phosphorus in ladle, steel splashed.
866	" 22.....	" "	"	M	36	Instep badly bruised; round fell off rollers.
867	" 19.....	" "	"	M	41	Finger badly cut; cutting scrap at big shears, piece with sharp edge slipped.
868	" 18.....	" "	"	M	65	Ends of four left fingers lacerated; hand came in contact with blade of planer.
869	" 21.....	" "	"	M	45	Cut on hand; reaching into machine to clean out chips, spindle caught hand against frame.
870	" 19.....	" "	"	M	....	Palm cut; hand caught on fastener of belt.
871	" 20.....	" "	"	M	15½	Cut on pupil of left eye; blank fell and caught in machine.
872	" 19.....	" "	"	M	30	Right thigh bruised; rock lake ore fell pinning him against car.
873	June 30.....	" "	"	M	25	Finger badly cut and cord severed; loading shell blanks, caught between blank and floor of car.
874	" 17.....	" "	"	M	36	Tip of thumb cut off; caught between two gears.
875	" 20.....	" "	"	M	34	Slab fell on foot and bruised it.
896	July 4.....	" "	"	M	18	Bruised knee cap by keg of nails from pile.
897	" 5.....	" "	"	M	34	Bruised thumb; fitting flange on pipe, caught thumb on bolt.
898	" 8.....	" "	"	M	25	Leg bruised while working at lathe; struck by coupling.
931	" 9.....	" "	"	M	24	Bruised and punctured foot; pulling billets out of furnace, one fell.
932	June 30.....	" "	"	M	30	Hand cut; while loading buggy, pulled bloom over.
935	July 13.....	" "	"	M	39	Finger cut; trapped between blanks and car.
936	" 10.....	" "	"	M	29	Nail taken off finger; while loading pig iron, piece fell.
937	" 8.....	" "	"	M	64	Two finger ends lacerated; came in contact with planer knives.
938	" 18.....	" "	"	M	25	Bruised fingers; crane chain slipped.
939	" 16.....	" "	"	M	47	Foot punctured; while breaking bars piece fell off and hit leg.
940	" 13.....	" "	"	M	20	Hand cut; pinched between two bars.
941	" 17.....	" "	"	M	47	Toe nail torn off by bar; end slipped from hand of another man.

942	"	20....	"	"	.....	"	.....	M	22	Two toes crushed; buggy wheel passed over foot.
943	June	27.....	"	"	.....	"	.....	M	23	Sprained knee; slipped on plate.
953	July	19.....	"	"	.....	"	.....	M	30	Loss of first finger, second bruised; while setting up nail machine, punch came down.
954	"	8....	"	"	.....	"	.....	M	64	Two fingers lacerated; came in contact with planer knives.
955	"	14.....	"	"	.....	"	.....	M	32	Back of hand badly cut; shell blank burst and knocked off guard.
971	"	19.....	"	"	.....	"	.....	M	35	Bruised and fractured rib; taking press apart one of the braces fell.
972	"	28.....	"	"	.....	"	.....	M	26	Compound fracture of leg below knee; caught in loops of wire and pulled in machine.
973	"	25.....	"	"	.....	"	.....	M	36	Toe bruised; end of charging car trickers fell on foot.
974	"	22.....	"	"	.....	"	.....	M	26	Foot bruised; shell fell on foot, blood poisoning resulting.
978	Aug.	4....	"	"	.....	"	.....	M	32	Foot badly bruised; beam slipped from handcar.
979	July	20.....	"	"	.....	"	.....	M	32	Instep cut while unloading blooms.
980	Aug.	17.....	"	"	.....	"	.....	M	26	Bruised foot and nail of toe; unloading oak ties, one slipped on foot.
981	July	22.....	"	"	.....	"	.....	M	27	Blood poison in right hand; sliver ran in hand.
982	"	30.....	"	"	.....	"	.....	M	28	Foot bruised; struck by plank.
983	Aug.	4.....	"	"	.....	"	.....	M	32	Finger crushed; let flange drop on hand.
984	"	2....	"	"	.....	"	.....	M	40	Badly bruised thumb; caught in thread machine.
985	"	2.....	"	"	.....	"	.....	M	54	Cut head and face, body bruised; struck by door of hopper, which fell.
986	"	6.....	"	"	.....	"	.....	M	25	Bruised and torn fingers; piece of scrap slipped and caught hand between scrap and buggy.
987	"	15.....	"	"	.....	"	.....	M	14	Eye and shin cut; shifting belt on pulley, hook caught.
988	July	29.....	"	"	.....	"	.....	M	21	While moving box of nails one ran in thumb.
989	Aug.	4.....	"	"	.....	"	.....	M	....	Small toe nearly severed; caught by truck wheel.
990	July	20.....	"	"	.....	"	.....	M	34	Bruised foot; let door of furnace fall.
991	Aug.	8....	"	"	.....	"	.....	M	52	Bruised foot; dropped end of heavy plank.
992	Aug.	8....	"	"	.....	"	.....	M	34	Bruised arm and hand; caught between steel and buggy.
993	"	11.....	"	"	.....	"	.....	M	36	Foot badly bruised; bar rolled over.
994	July	23.....	"	"	.....	"	.....	M	59	Knee bruised; knocked pin out of hot saw; accidently hit knee.
998	"	20.....	"	"	.....	"	.....	M	32	Bloom swerved round and cut instep.
999	May	15.....	"	"	.....	"	.....	M	47	Toe squeezed; got foot on rail in front of buggy.
1000	July	25.....	"	"	.....	"	.....	M	32	Fell on hot bed and burned arm, hip and side of head.
1001	Aug.	8....	"	"	.....	"	.....	M	25	Arms burned by gas.
1019	"	8....	"	"	.....	"	.....	M	30	Badly burned arm; while tapping open hearth furnace, gas blew out.
1020	"	9...	"	"	.....	"	.....	M	45	Badly bruised right arm; opening doors of coal cars, lever flew round and caught him.
1021	"	19.....	"	"	.....	"	.....	M	20	Badly cut right arm; billet slipped off skidway and sharp edge struck arm.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 6—Continued				
1022	Aug. 13...	Steel Co. of Canada	Hamilton.....	M	31	Crushed thumb; helping to close pockets of steel dump, castings broke.
1023	July 27.....	" "	"	M	....	Bruised and punctured leg; pulling bar out of burn out when another bar struck him.
1024	Aug. 14.....	" "	"	M	42	Finger crushed; caught between ladle and ladle ball.
1031	" 12.....	" "	"	M	24	Burn on right hand; charging furnace, piece of hot scale flew.
1032	" 22.....	" "	"	M	27	Face slightly burned; while opening tapping hole, heat broke out.
1033	" 14.....	" "	"	M	54	Top of big toe crushed; steel bloom fell.
1034	" 13.....	" "	"	M	20	Left foot bruised; bloom slipped on foot.
1035	" 14.....	" "	"	M	22	Chest cut open badly; slipped and fell forward on barrow of steel.
1036	" 21.....	" "	"	M	38	Badly burned eyesight; putting chain on ladle to dump slag; spark flew from ladle.
1037	" 13.....	" "	"	M	22	Bruised finger while loading billets on chipper bench.
1038	" 16.....	" "	"	M	27	Skin torn off finger end; caught between wire and wire block.
1039	June 20.....	" "	"	M	23	Put foot in loop rod of wire to stop wire block running upon his leg and broke skin.
1040	Aug. 21.....	" "	"	M	25	Lacerated arm pit; overbalanced and fell in trench; caught arm pit on upright casting.
1041	" 18.....	" "	"	M	29	Cut and bruised left leg; pushing bar into cut-off machine, end of ram slipped off bar.
1042	" 14.....	" "	"	M	23	Bruised and burned arm and side; while piling shells struck by shell thrown by another man.
1043	" 19.....	" "	"	M	19	Bruised right knee; struck by hot billet.
1044	" 22.....	" "	"	M	37	Hand cut badly; sharp edge of billet struck him.
1045	" 24.....	" "	"	M	20	Badly bruised leg, thigh, and lower part of abdomen; walking along bridge of crane while in motion, overalls caught in bolt of coupling.
1046	" 9.....	" "	"	M	32	Slightly bruised back; fell from ladder into tank.
1047	" 16.....	" "	"	M	23	Left hand torn and side bruised; inserting bar in wheel to give winch a start, started suddenly and bar hit him.

1048	" 23.....	"	"	.....	"	.....	M	44	Bruised first finger; while working with long bars on a screw machine.
1049	" 24.....	"	"	.....	"	.....	M	35	Bruised back; shear legs standing over trench putting in pipe, knocked shears legs over, falling on his back.
1063	Sept. 3.....	"	"	.....	"	.....	M	27	Badly cut left hand; unloading shell bars, hand slipped on sharp edge of bar.
1064	Aug. 23.....	"	"	.....	"	.....	M	26	Small puncture of right foot; ran sharp piece of scrap steel in same.
1065	" 22.....	"	"	.....	"	.....	M	35	Cut on knee, bruised toe; trolley pulley jumped track and hit him while working on press tongs.
1066	" 29.....	"	"	.....	"	.....	M	40	Finger top crushed; caught between two pieces of timber.
1067	" 29.....	"	"	.....	"	.....	M	25	Four fingers grazed and bruised; shearing plate when hand caught.
1068	" 29.....	"	"	.....	"	.....	M	38	Nail off left finger; missed chisel and struck finger with hammer.
1069	Aug. 26.....	"	"	.....	"	.....	M	27	Cut and bruised hand and fingers; unloading iron pockets, caught between two.
1070	" 26.....	"	"	.....	"	.....	M	43	Slight bruise; lyndite bars rolled on right leg.
1071	" 28.....	"	"	.....	"	.....	M	35	Three fingers amputated; billet slipped catching hand between it and another part of machine.
1072	" 25.....	"	"	.....	"	.....	M	30	Fracture of first metacarpus, right hand; carrying shell, one rolled on hand.
1073	" 22.....	"	"	.....	"	.....	M	23	Punctured palm of right hand; grinding finishing passes when bar struck him on palm of hand.
1074	" 28.....	"	"	.....	"	.....	M	27	Cut and bruised hand; throwing cone belt off the cone with right hand.
1075	" 13.....	"	"	.....	"	.....	M	36	Burns on right hand; while tapping No. 8 open hearth furnace, gas flew out, burning right hand.
1085	Sept. 5.....	"	"	.....	"	.....	M	59	Arm badly bruised; caught in twisting machine.
1086	" 3.....	"	"	.....	"	.....	M	25	Cut on head; lever from door of furnace fell.
1087	" 9.....	"	"	.....	"	.....	M	20	Arm badly cut; missed hold and fell from car on some scrap.
1088	" 5.....	"	"	.....	"	.....	M	23	Rupture of right groin; while helping to sledge tapping hole at furnace.
1089	" 2.....	"	"	.....	"	.....	M	27	Badly bruised finger; while rolling bars down on skids.
1090	" 9.....	"	"	.....	"	.....	M	14	First joint thumb amputated; thumb pulled into gear.
1091	Aug. 28.....	"	"	.....	"	.....	M	27	Back bruised; hit by plank.
1092	Sept. 11.....	"	"	.....	"	.....	M	20	Toe cut and bruised; puncher fell on foot.
1093	Aug. 30.....	"	"	.....	"	.....	M	....	Arm badly burned by flash from billet.
1116	" 17.....	"	"	.....	"	.....	M	54	Leg bruised; while using jack to wire chute, same kicked out.
1117	Sept. 6.....	"	"	.....	"	.....	M	63	Foot bruised; billet fell off barrow.
1118	Aug. 29.....	"	"	.....	"	.....	M	27	Fell in front of flying shears and bar fell on fingers taking nail off.
1141	Sept. 6.....	"		.....	"	.....	M	36	Ruptured groin; lifting tie.
1142	" 6.....	"	"	.....	"	.....	M	35	Arm and leg burned by bar from rolls.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 6—Continued				
1143	Aug. 28....	Steel Co. of Canada	Hamilton	M	48	Arm badly cut; fellow workman ran against him with sharp corner while charging furnace.
1144	Feb. 28....	" "	"	M	34	Fingers broken and crushed; while cutting bridge plate a piece opened up on him.
1145	Sept. 11....	" "	"	M	22	Fell off hoist and cut knee; body also bruised.
1146	Aug. 24....	" "	"	M	23	Piece of wire stuck in hand causing blood poisoning.
1156	Sept. 18....	" "	"	M	24	Finger fractured; caught between box and car while loading scrap.
1157	" 14....	" "	"	M	30	Bruised foot; bar struck rail knocking it out of place.
1158	" 10....	" "	"	M	34	Scalp wound; bruised shoulder and electrical shock while cleaning live side of switch and fell.
1159	" 16....	" "	"	M	32	Back sprained; thrown from cart.
1160	" 15....	" "	"	M	20	Plate frame fell and bruised foot.
1161	" 17....	" "	"	M	24	Face burned while tapping heat.
1162	" 18....	" "	"	M	21	Fractured knee cap while coupling buggies.
1171	Aug. 31....	" "	"	M	45	Bruised breast; fell against pile of bricks.
1172	Sept. 20....	" "	"	M	34	Jaw cut by piece of scrap from shears.
1184	" 15....	" "	"	M	58	Badly wrenched leg; caught foot in track.
1185	Aug. 30....	" "	"	M	32	Knuckle of thumb burned and cut at joint; struck against emery wheel.
1186	Sept. 23....	" "	"	M	30	Right arm and hand burned; putting gas pipe in end and gas blew.
1187	" 25....	" "	"	M	23	Cut in forehead and sprained ankle; lost balance while walking along platform and jumped to ground.
1197	" 28....	" "	"	M	25	Finger smashed, foot cut and body bruised; blooms fell off pile and knocked him down.
1198	" 26....	" "	"	M	22	While opening up tap hole, heat broke out burning hands and face.
1199	" 29....	" "	"	M	21	Taking punch from press same slipped and fell on thumb.
1200	" 25....	" "	"	M	41	Back of hand cut badly; while wheeling barrow of steel, struck against projecting bar.
1201	" 22....	" "	"	M	26	Side of neck burned; hot bars slipped from shoulder pad.
1202	" 16....	" "	"	M	45	Ear cut through; fell against pile of blooms.
1213	" 27....	" "	"	M	23	Burned face, arms and hands; opening tap hole in furnace, heat broke out.
1214	" 27....	" "	"	M	45	Crushed thumb; caught between bar and bolt on shears.
1215	" 30....	" "	"	M	39	Thumb cut; slipped and pipe fell from shoulder.

1216	"	30....	"	"	.....	"	.....	M	34 Legs bruised; breaking belt caused block of steel to fall.
1217	Oct.	5...	"	"	.....	"	.....	M	27 Crushed and bruised hips; jammed between cab and carriage of derrick.
1218	Sept.	27...	"	"	.....	"	.....	M	35 Grazed leg; piece of scrap fell from car.
1219	"	30....	"	"	.....	"	.....	M	23 Fracture of right tibia; steel runner fell from crane.
1220	Oct.	3....	"	"	.....	"	.....	M	36 Finger lacerated; while reducing die, pins on emery wheel slipped.
1221	"	7....	"	"	.....	"	.....	M	52 Skin taken off top of first finger; caught between billets.
1249	Sept.	20....	"	"	.....	"	.....	M	47 Ruptured himself lifting bundle of wire from block.
1250	Oct.	12....	"	"	.....	"	.....	M	55 Burns on back and buttocks while opening up ladle, steel splashed.
1259	"	11....	"	"	.....	"	.....	M	39 Hand badly squeezed; rack being lowered into position caught top of thumb.
1260	"	13....	"	"	.....	"	.....	M	25 Fractured finger; while fitting a key in gear of machine, missed key and struck hand.
1261	"	12...	"	"	.....	"	.....	M	35 Bruised two toes; heavy bar fell.
1268	"	7....	"	"	.....	"	.....	M	20 Bruised finger; forgings dropped.
1269	"	14....	"	"	.....	"	.....	M	48 Bruised toe; piece of scrap fell from shears.
1270	"	15....	"	"	.....	"	.....	M	35 Badly torn thumb; blade of hack saw broke.
1271	"	16....	"	"	.....	"	.....	M	21 Loss of third finger at first joint; caught between cable and block on crane.
1278	Sept.	25....	"	"	.....	"	.....	M	50 Side bruised, rib fractured; while putting bar into hack saw, bar slipped.
1282	Oct.	11....	"	"	.....	"	.....	M	28 Hand burned; while using oil and water to cool dies, air used for same burned hand.
1283	"	16....	"	"	.....	"	.....	M	26 Foot bruised; timber slipped and caught foot against frame of lathe.
1284	"	17....	"	"	.....	"	.....	M	32 Toe cut; piece of steel rolled on foot.
1285	"	17....	"	"	.....	"	.....	M	40 Foot bruised; die fell.
1286	"	11....	"	"	.....	"	.....	M	17 Thumb bruised; hit it with hammer causing sloughing.
1287	"	15....	"	"	.....	"	.....	M	46 Bruised side; caught between two cars.
1310	"	20....	"	"	.....	"	.....	M	30 Top of foot bruised; tongs slipped and allowed bar of steel to fall.
1311	"	22....	"	"	.....	"	.....	M	40 Mouth cut and teeth broken; struck by bar, chain broke.
1312	"	21....	"	"	.....	"	.....	M	40 Artery severed; caught finger between two pieces of timber.
1313	"	24....	"	"	.....	"	.....	M	57 Side bruised, ribs badly crushed; wheeling coal to boiler and slid into hopper.
1314	"	24....	"	"	.....	"	.....	M	50 Right hand badly smashed; loading billets on buggy, caught between bar and gauge.
1315	"	26....	"	"	.....	"	.....	M	38 Badly crushed hand; all fingers broken and first taken off; put hand on crane.
1316	"	25....	"	"	.....	"	.....	M	30 Bruised foot; helping shear scrap, piece slipped.
1317	"	23....	"	"	.....	"	.....	M	19 Badly grazed right hand; taking up pipe from track around hand car, car caught hand.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 6—Continued				
1318	Oct. 23....	Steel Co. of Canada	**Hamilton**	M	27	**Second right finger burst and nail torn off; while putting on skid, billet rolled from bed to man's hand.**
1319	" 24....	" "	"	M	55	Badly torn fingers; rolling steel bars on skids, hand caught between bars and steel rail.
1320	" 23....	" "	"	M	27	Flesh and nail torn off left thumb; caught between ladle and chair.
1321	" 15....	" "	"	M	31	Badly burned eye; while rolling an ingot, piece of scale flew into eye.
1322	" 6....	" "	"	M	....	Finger cut; rolling scrap in annealing room on scrap machine, caught finger in wire.
1327	" 26....	" "	"	M	25	Badly bruised toe; loading scrap into buggies, a large piece slipped and fell on foot.
1328	" 9....	" "	"	M	40	Bruised right tibia; while carrying pipe from shop, piece fell and rebounded.
1329	" 27....	" "	"	M	21	Cut and burned side of head behind ear; another man threw hot shell from press striking him.
333	Feb. 29....	Steel & Radiation, Ltd.	St. Catharines....	M	30	Burned left hand; hot iron splashed.
645	May 8....	" "	"	M	37	Large toe badly crushed; radiator section fell on foot.
729	" 31....	" "	"	M	32	Portion of finger cut off; came in contact with planer knives.
A838	Feb. 9....	" "	"	M	....	Foot crushed and bruised; iron pattern fell on it.
890	July 5....	" "	"	M	....	Iron pattern dropped on fingers and burst two.
911	" 17....	" "	"	M	32	Toe burst; radiator loop fell on foot.
1077	Aug. 29....	" "	"	M	44	Left foot badly bruised; while setting up boiler section it slipped and fell.
1078	Sept. 1....	" "	"	M	44	Left foot badly burned; melted iron splashed.
1296	Oct. 21....	" "	"	M	28	Burned arm and leg; tripped over riddle while carrying molten iron.
1297	" 21....	" "	"	M	....	Arm, shoulder, and neck burned by molten iron.
266	Jan. 17....	Toronto, Hamilton & Buffalo Railway Co.	Hamilton....	M	55	Injured arm; lowering anvil into place, hook of chain block broke, striking arm and injuring wrist.
267	" 20....	" " ..	"	M	45	Injured wrist; sliding brake beams down store house steps while picking one up, another struck wrist.
268	" 22....	" " ..	"	M	60	Bruised knuckle; caught hand between handle of poker and boiler room door, while cleaning fire.
276	Feb. 3....	" " ..	"	M	41	Blood poison from bruised finger.

282	" 5....	" " ..	"	M	34	Injured side; slipped on deck of engine and fell on wind shield.
334	" 21....	" " ..	"	M	45	Small toe fractured; moving steel plate, it struck flue sheet causing it to fall.
409	Mar. 11....	" " ..	"	M	49	Toe bruised; helper pushed block of iron over.
410	" 15....	" " ..	"	M	50	Left leg bruised; extension spindle of jack broke allowing wheels to fall.
511	Apr. 8....	" " ..	"	M	48	Nail and finger torn and bruised; moving flat car aprons, fingers caught between apron and pile.
65	Nov. 19....	Union Carbide Co.	Welland.....	M	20	Foot burned; stepped on match which ignited, setting fire to waste.
138	Dec. 20....	" "	"	M	18	*Fractured skull; while releasing ingot from car, end of bar struck him.
174	" 25....	" "	"	M	30	Leg burned; overalls caught fire from furnace.
175	" 20....	" "	"	M	38	Bruised side, ribs bent; fell and struck pile of bricks.
269	Jan. 26....	" "	"	M	26	Burned face and neck; emptying can of carbide sweepings which caught fire.
270	" 20....	" "	"	M	45	Severe bruises; lost footing while carrying pipe.
391	Mar. 11....	" "	"	M	54	Compound fracture of toe; chill car ran into drums near track, causing one to fall.
514	Apr. 3....	" "	"	M	22	Face burned; clothes ignited from furnace while tapping with bar.
515	" 3....	" "	"	M	24	Face and hands burned; clothes ignited from furnace.
673	Jan. 26....	Wright Co.	Hamilton.....	M	....	Lost nearly half of right hand; smashed in press.
674	Feb. 15...	" "	"	M	39	Lost second finger at first joint; caught in press.
675	Mar. 17....	" "	"	M	21	Four fingers severed; caught in press.
968	Aug. 4....	" "	"	M	11	*Fell down elevator shaft.
1253	Oct. 16.....	" "	"	M	65	*Fell down elevator shaft.
767	May 22....	Yates Machine Co.	"	M	....	Crushed fingers while fitting machine.
796	July 7....	" "	"	M	....	Arm crushed; caught between lever and planer table.
		DISTRICT No. 7				
16	Jan. 6....	Andrews Wire Works of Canada	Watford.....	M	....	Finger cut in punch press.
18	Apr. 22....	" " ..	"	M	....	Finger cut in punch press.
17	Feb. 19...	" " ..	"	M	....	Acid burn on foot.
21	May 26....	" " ..	"	M	....	Hand crushed under a machine.
11	Feb. 21...	J. Campbell & Son	London.....	M	....	Rupture; strained himself while handling lumber.
24	July 28....	Chaplin Wheel Co.	Chatham.....	M	....	Fingers bruised; nail off; machine slipped on skids and caught hand.
27	Aug. 22....	Clinton Knitting Co.	Clinton.....	M	....	Finger caught in gears of knitting machine; end crushed and cut.
25	" 18....	Dresden Canning Co.	Dresden.....	M	20	Part of finger off, others squeezed; caught in elevator cable.

*Fatal.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 7—Continued				
9	Dec. 23, '15.	Dyment Baker Lumber Co...	London.....	M	....	Foot injured by horse stepping on it.
28	Aug. 25, '16.	" " ..	"	M	....	Cut two fingers on shaper.
6	Dec. 6, '15.	Ford Motor Co.	Walkerville.....	M	51	*Fracture at base of skull; stepped into hole in floor of new power house under construction, fell 15 feet.
10	Feb. 23.....	" "	"	M	57	*Severe scalp wound, fractured collar bone, bruised; looked over gate and elevator caught head.
8	Jan. 26....	Goderich Organ Co.	Goderich.....	M	50	Loss of finger at first joint while operating rip saw.
31	Oct. 24.....	" "	"	M	46	Little finger amputated while shaping seats.
13	Apr. 19....	London Rolling Mill Co. ...	London.....	M	23	Foot burned by hot bar.
14	" 28....	" " " ..	"	M	23	Thumb badly smashed; cutting piece of scrap iron on shears.
15	Mar. 29....	" " " ..	"	M	38	Back of hand burned; piece of hot cinder flew from rolls nearby.
19	May 12....	" " " ..	"	M	33	Rib cracked; pulling pile of scrap iron out of furnace, hook slipped.
29	Aug. 26....	" " " ..	"	M	30	*Jaw broken with blow and skull fractured with fall; grinding shear blade.
30	Sept. 14...	" " " .	"	M	35	Cut on leg by sliver on bar of iron.
32	Oct. 24....	" " " ..	"	M	44	Struck in eye by piece of clay.
20	May 3....	London & Petrolia Barrel Co.	"	M	40	Hand cut; stumbled against saw.
26	Aug. 28....	Lufkin Rule Co.	Windsor.....	M	25	*Fell backwards off platform; struck elbows, shoulder and head; unconscious.
3	Dec. 10, '15.	McLagan Furniture Co.	Stratford.....	M	....	*Blade of re-saw broke and struck top of head.
4	June 2, '15.	Perfection Stove Co.	Sarnia.....	M	49	End of finger smashed, amputated; part of machine broke.
5	July 16, '15	" "	"	M	17	Three fingers crushed; amputated at knuckle of index; part of machine broke.
2	Nov. 16, '15	Stratford Mfg. Co.	Stratford.....	M	45	Chin cut, probable loss of eye; piece of wood flew up.
7	Dec. 16, '15.	Strathroy Furniture Co.	Strathroy.....	M	16	Fleshy part of finger end off; squeezed by stock coming through planer rolls.
12	Mar. 18, '16	" "	"	M	26	End off finger; pinched in scraping machine.
22	Jan. 28...	" "	"	M	40	Foot injured by piece of coal falling on instep.
23	July 25....	" "	"	M	15	Toe crushed; pinched between elevator and floor.
1	Nov. 2, '15.	T. H. Taylor Co., Ltd.	Chatham.....	M	...	Wrist injured; jolted off passenger elevator and fell to floor.
		DISTRICT No. 8				
10	Oct. 25, '15.	Anglo-Can. Leather Co.	Bracebridge.....	M	20	*Internal injuries; caught between drum wheel and shafting.

119	May 11, '16.	J. J. Allen	Mount Irwin	M	....	Hand cut on saw.
9	Nov. 16, '15.	Bonner-Worth Co.	Peterborough	F	16	Fingers of both hands torn; caught hand on tape in machine.
34	Jan. 12, '16.	" "	"	F	14	Finger cut off first joint; caught on waste machine.
59	Feb. 18....	" "	"	F	....	Hand bruised seriously; caught in faller.
70	Mar. 18....	" "	"	M	15	Finger crushed between two gears, breaking nail and flesh.
73	" 25....	" "	"	F	22	Bruised arm badly; caught in pulley.
19	May 12....	Canada Cement Co.	Belleville	M	....	Buried under slide of cement.
20	July 14....	" "	"	M	....	Injured thumb; caught in shears.
21	Nov. 9, '15.	" "	"	M	....	Rivet being driven through tender on engine went into eye, bar not covering hole.
22	Oct. 29, '15.	" "	"	M	....	Finger fractured; while fitting ball mill head, wrench slipped.
23	Aug. 9, '15	" "	"	M	....	Nail on thumb nearly cut off on string cutter.
24	Sept. 23, '15.	" "	"	M	....	Leg mangled and broken, amputated, hand also torn in palm; caught in screw conveyor.
25	Oct. 1, '15.	" "	"	M	....	Face and hands burned; hot clinker fell into pail of oil, causing explosion.
26	Dec. 11, '15.	" "	"	M	....	Three fingers crushed in conveyor, and amputated.
31	Dec. 21, '15.	" "	"	M	....	Hand injured; caught on anchor bolts.
6	Nov. 10, '15	Canadian Chewing Gum Co.	Toronto	M	16	Finger nail of little finger torn off in machine.
150	July 17, '16	" "	"	M	58	Falling of bags of chicle crushed foot against truck.
1	Oct. 23, '15.	Canadian Locomotive Co.	Kingston	M	....	Finger mangled in lathe.
2	" 31, '15	" "	"	M	24	Thumb split open; jammed between shell and gauge.
3	" 27, '15	" "	"	M	20	Throat sheet fell on foot and bruised it.
4	" 21, '15.	" "	"	M	19	Breast and back strained while lifting bar of steel.
5	" 22, '15	" "	"	M	55	Piece cut off finger on cold saw.
11	Nov. 24, '15	" "	"	M	32	Head and shoulders strained and bruised; pulley blocks parted from crane and struck him.
12	" 8, '15.	" "	"	M	....	Fingers jammed while unloading car wheels.
13	" 5, '15.	" "	"	M	45	Finger crushed; draw bar fell on hand.
14	" 23, '15.	" "	"	M	30	Loss of little finger above first joint; wrench slipped and hand struck tool.
15	" 22, '15.	" "	"	M	34	Top of finger cut off; jammed between plate and furnace.
16	" 15, '15	" "	"	M	18	Toe bruised; weight fell off bench.
17	" 10, '15.	" "	"	M	25	Knee cut; fell against casting.
18	" 19, '15.	" "	"	M	40	Hand burned between thumb and finger; starting motor, controller back fired.
35	" 29, '15.	" "	"	M	49	Ladder fell from line shafting and broke his thumb.
36	Jan. 7, '16.	" "	"	M	17	Shock to legs and feet; fell from ladder.
37	Nov. 26, '15.	" "	"	M	26	Thumb cut and jammed; caliper caught in shell, pulled hand in between shell and tool head.
38	Dec. 29, '15.	" "	"	M	29	Top of little finger cut off while operating jointer.

*Fatal.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 8—Continued				
39	Nov. 26, '15	Canadian Locomotive Co. ..	Kingston.....	M	32	**Shock caused injury to bones in feet; fell from top of ladder.**
40	Dec. 1, '15.	" " ..	"	M	32	Iron flask fell on leg breaking two small bones.
41	" 6, '15.	" " ..	"	M	50	Loss of big toe; while forging rails one slipped on foot.
42	" 21, '15.	" " ..	"	M	....	Sprained spinal cord while placing heavy chain in crane.
43	Jan. 5, '16.	" " ..	"	M	27	Shell rolled on foot and fractured two bones.
47	" 27.....	" " ..	"	M	36	Little finger badly jammed by stay bolt nippers.
48	" 14.....	" " ..	"	M	19	Hand burned by electric wire.
49	" 13.....	" " ..	"	M	35	Hip fractured; truck slipped off crane hook and struck him.
50	" 17.....	" " ..	"	M	23	Head injured; while repair man was tightening nut, wrench slipped.
51	Feb. 5.....	" " ..	"	M	53	While unloading planks, one fell on ankle.
52	" 3.....	" " ..	"	M	29	Finger jammed between chuck and lathe carriage.
53	" 5.....	" " ..	"	M	36	Toe crushed; shell fell on foot.
54	" 9.....	" " ..	"	M	16	Hand crushed while filing mandrel; end of file entered hand.
55	" 9.....	" " ..	"	M	46	Hand cut by glass; blood poisoning.
56	Jan. 24.....	" " ..	"	M	39	Leg broken; scaffold fell.
60	Feb. 8.....	" " ..	"	M	50	Two ribs broken; fell against flangeing press.
61	" 10.....	" " ..	"	M	36	Gash on leg; knocking bolt out of steam hammer, bolt slipped.
62	" 23.....	" " ..	"	M	45	Foot badly swollen; loading ties on car, one slipped.
63	" 12.....	" " ..	"	M	45	Injured knee cap; pipe slipped and rolled over.
64	" 17.....	" " ..	"	M	21	Head cut; shell boxes toppled over.
65	" 14.....	" " ..	"	M	42	Jaw and side of face cut; removing cylinder from planer to floor, hooks slipped and cylinder struck him.
66	" 18.....	" " ..	"	M	40	Blood poisoning in foot; nail went through sole of shoe into foot.
67	" 21.....	" " ..	"	M	49	Small toe pierced by nail which he stepped on.
68	" 24.....	" " ..	"	M	31	Foot badly bruised, one toe amputated; jammed between tool box and a brick.
69	" 25.....	" " ..	"	M	26	Finger cut and jammed; counter balance fell off spindle shaft.
74	Mar. 11.....	" " ..	"	M	22	Finger cut, blood poisoning set in; wrench slipped and hand struck machine.
75	" 17.....	" " ..	"	M	....	Foot crushed; while piling billets, one rolled on foot.

76	Feb.	27....	"	"	..	"	.....	M	35	Scalp split open; struck on head by falling timber.
77	"	29....	"	"	..	"	.....	M	55	End of two fingers cut; caught in jointer knives.
78	Mar.	1....	"	"	..	"	.....	M	37	Forefinger cut off at first knuckle; caught in tool post of planing machine.
79	"	5....	"	"	..	"	.....	M	41	Severe rupture on side; slipped.
80	"	6....	"	"	..	"	.....	M	44	Foot bruised; piece of steel fell from drill table.
81	"	7....	"	"	..	"	.....	M	34	Wrist sprained; cleaning off machine while it was in motion.
82	"	9....	"	"	..	"	.....	M	27	Cut in palm of hand; grinding dowel pins on emery wheel.
83	"	13...	"	"	..	"	.....	M	23	Scratched hand against machine; blood poisoning.
84	"	24....	"	"	..	"	.....	M	19	Finger cut; caught by tool.
85	"	27....	"	"	..	"	.....	M	....	Two toes broken; billets fell from chute.
86	"	22....	"	"	..	"	.....	M	54	Foot bruised; shell rolled off bench on foot.
87	"	23....	"	"	..	"	.....	M	54	Bone in foot broken; crane chain fastened to plate by bolt which came out and plate fell.
88	"	27....	"	"	..	"	.....	M	30	Fingers injured; grinding tool on emery wheel, tool slipped.
89	"	22....	"	"	..	"	.....	M	29	Health broken down due to firing boilers.
90	"	27....	"	"	..	"	.....	M	22	Two fingers injured; tool slipped on emery wheel.
91	"	23....	"	"	..	"	.....	M	37	Foot bruised; chain fell.
94	Apr.	10....	"	"	..	"	.....	M	24	Thumb severed at first joint; caught between piece of iron and shears.
95	Mar.	25....	"	"	..	"	.....	M	37	Blood poisoning; sliver of steel entered arm.
96	Apr.	7....	"	"	..	"	.....	M	26	Top of finger severed; work shifted while setting up on machine.
97	"	10....	"	"	..	"	.....	M	42	Severe cut on forehead over eye; plank from scaffolding fell.
98	"	6....	"	"	..	"	.....	M	28	Loss of finger; gauging shell while machine in motion.
99	Mar.	27...	"	"	..	"	.....	M	....	Two fingers injured; tool slipped on emery wheel.
101	Dec.	28....	"	"	..	"	.....	M	....	Instep of foot injured; running board of stripping engine fell on foot.
102	Mar.	17....	"	"	..	"	.....	M	28	Foot slightly bruised; let shell billet fall.
103	Apr.	19....	"	"	..	"	.....	M	33	Back and hip injured; fell while conveying a wooden horse backwards.
104	"	13....	"	"	..	"	.....	M	28	Thumb badly cut by shears.
105	"	21....	"	"	..	"	.....	M	23	Hand and arm mutilated and broken; slipped in between cone and guard of lathe.
106	"	8....	"	"	..	"	.....	M	41	Ribs injured; fell from car while unloading steel.
110	May	3....	"	"	..	"	.....	M	31	Foot crushed; working in coal boat, foot jammed by coal basket.
111	"	1....	"	"	..	"	.....	M	49	Hand badly lacerated; jammed between shear guard and piece of iron.
112	"	1....	"	"	..	"	.....	M	42	Big toe broken; steel bar rolled on foot.
113	Apr.	27....	"	"	..	"	.....	M	28	Wrist injured; shell fell on it.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 8—Continued				
114	Apr. 24....	Canadian Locomotive Co. ..	Kingston.....	M	37	Portion of thumb and finger severed; fell against press.
115	May 23....	" " ..	"	M	25	Rupture of bowels; lifting face plate from lathes.
120	" 9....	" " ..	"	M	48	Two fingers bruised; jammed hand while turning work on planer.
121	" 4....	" " ..	"	M	40	Leg burned; while scraping scale off hot shell, piece entered trousers.
122	" 5....	" " ..	"	M	44	Eye injured; piece of steel struck him.
123	" 5....	" " ..	"	M	21	Two fingers bruised; wiping off a lathe while in motion.
124	" 6....	" " ..	"	M	27	Toes slightly bruised; chain fell.
125	" 2....	" " ..	"	M	54	Palm of hand burned; while handling hot shells.
126	" 30....	" " ..	"	M	23	Hand cut by lathe dog while turning up a cutter.
127	" 31....	" " ..	"	M	28	Fingers cut and jammed; bar of steel rolled on hand.
128	" 31....	" " ..	"	M	37	Toes jammed; shell billet fell on foot.
129	Apr. 27....	" " ..	"	M	21	Toes bruised; dropped shell on foot.
130	May 27...	" " ..	"	M	30	Hand crushed; trying extra tool while machine was in motion.
131	June 6....	" " ..	"	M	....	Toes bruised; steel billet fell on foot.
135	" 19...	" " ..	"	M	27	Hand cut on planer knives.
136	Feb. 27....	" " ..	"	M	46	Ribs broken; fell into trench back of shell.
137	June 12...	" " ..	"	M	28	Shoulder injured; scaffolding fell.
138	" 12....	" " ..	"	M	47	Finger cut; caught on collar of drop hammer.
139	" 9....	" " ..	"	M	40	Back injured; struck by hot shell billet which slipped from tongs.
140	"	" " ..	"	M	....	Head gashed; slipped and struck head on hammer die.
141	" 7....	" " ..	"	M	55	Finger jammed while placing shell on bench.
142	" 6....	" " ..	"	M	15	Finger jammed while setting work on shaper.
151	" 5....	" " ..	"	M	40	Emery and steel rust blown into eye.
152	" 19....	" " ..	"	M	45	Toe injured; let casting fall.
153	July 18....	" " ..	"	M	19	Cut hand on planer tool.
154	" 11....	" " ..	"	M	38	Shoulder cut; struck by piece of shell.
155	June 30....	" " ..	"	M	40	Cut finger on shell; blood infection.
172	Aug. 21....	" " ..	"	M	26	Eye badly cut; cutting flew up.
173	" 28....	" " ..	"	M	23	Arm and leg strained; clothes became entangled in shaft.
174	" 24....	" " ..	"	M	34	Hip burned; fell on hot shell.
175	23....	" " ..	"	M	22	Thumb jammed; while placing steel plate under punch, plate slipped.

176	"	19....	"	"	..	"	.....	M	51	Foot jammed; dog on chain slipped allowing plate to fall on foot.
177	"	11....	"	"	..	"	.....	M	19	Gash on forehead, blood poisoning; piece of brass flew from tool.
178	"	19....	"	"	..	"	.....	M	23	Finger broken; ladder fell on hand.
179	"	22....	"	"	..	"	.....	M	52	Toe smashed; shell fell.
159	"	15....	"	"	..	"	.....	M	34	Foot bruised; equalizer beam slipped.
160	"	15....	"	"	..	"	.....	M	34	Pupil of eye injured; while beading tubes with air, head steel burr flew from tool.
161	"	12....	"	"	..	"	.....	M	19	Finger cut; caught between tool post and forming tool.
162	"	12....	"	"	..	"	.....	M	22	Slight gash on thumb; roughing tool slipped off emery wheel.
163	"	2...	"	"	..	"	.....	M	20	Muscles around heart strained; while removing armature from motor.
164	July	25....	"	"	..	"	.....	M	20	Jaw and ear drum affected; piece of steel struck behind ear.
165	"	21....	"	"	..	"	.....	M	46	Foot bruised; sixty-pound shell fell.
187	Aug.	19....	"	"	..	"	.....	M	46	Muscles in back strained while changing dies in press.
189	Sept.	6....	"	"	..	"	.....	M	19	Blood poisoning from cut on hand; wrench slipped.
188	"	19....	"	"	..	"	.....	M	52	Toes crushed; repairing engine in power house.
190	Aug.	30....	"	"	..	"	.....	M	47	Toes jammed; bar of iron fell.
191	"	29....	"	"	..	"	.....	M	27	Finger jammed by core plate.
192	"	22....	"	"	..	"	.....	M	21	Thumb crushed while punching angle iron.
194	Sept.	19....	"	"	..	"	.....	M	17	Fingers cut by planer knives.
195	"	23....	"	"	..	"	.....	M	34	Hand and wrist injured; caught between belt and core while cleaning.
196	"	25....	"	"	..	"	.....	M	25	Leg slightly bruised; a die fell.
197	Oct.	3....	"	"	..	"	.....	M	29	Fingers badly jammed; while fitting smoke box fronts, one slipped.
198	"	5....	"	"	..	"	.....	M	40	Leg and foot twisted; while pushing casting into place, block slipped out.
199	"	5....	"	"	..	"	.....	M	43	Toe crushed slightly; shell rolled from truck.
200	"	6....	"	"	..	"	.....	M	20	Gash on thumb, blood poisoning; while placing gauge on shell a cutting flew.
201	"	8....	"	"	..	"	.....	M	22	Foot badly bruised; shell fell off pile.
202	"	18....	"	"	..	"	.....	M	20	Cut on knuckle, later infected; while tightening plug in shell, wrench slipped.
183	Sept.	26....	Chevrolet Motor Co. of Canada		Oshawa		.....	M	28	Thumb lacerated on sharp edge of metal.
147	June	30....	Consumers Gas Co.		.....	Toronto	.....	M	36	*Crushed against shaft casing by arm on stoking machine.
157	July	5....	"	"	.....	"	.....	M	22	Knuckle cut and verdigris from burners poisoned finger while cleaning chimney.
158	Aug.	28....	"	"	.....	"	.....	M	40	Forefinger caught between mouth piece of retort and chute.
182	Sept.	15....	"	"	.....	"	.....	M	42	Collar bone broken; trench caved in.

*Fatal.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		District No. 8—Continued				
7	Nov. 12, '15	Crossen Car Co.	Cobourg	M	60	Burns on back of hand and palm of other hand; using paint and varnish remover, which exploded.
27	Sept. 13, '15	DeLaval Dairy Supply Co.	Peterborough	M	....	Ends of two fingers crushed off in disc press.
28	" 30, '15.	" "	"	M	....	Hip cut; fell on sheet of metal with upturned edge.
29	Oct. 25, '15.	" "	"	M	....	Arm broken in three places; put it through running belt.
30	Nov. 26, '15	" "	"	M	....	Two fingers taken off by cogs of rod bending machine.
44	Jan. 28, '16.	" "	"	M	20	Chip of angle iron in hand while drilling angle iron on drill press.
57	Feb. 5....	" "	"	M	16	Leg cut on edge of loose pulley while fitting belt to grinder.
107	Apr. 24....	" "	"	M	....	Finger cut; clearing rippings off saw table.
108	May. 1...	" "	"	M	32	Loss of first joints of thumb and finger on saw.
116	" 4....	" "	"	M	24	Loss of portion of finger nail and flesh end of other finger in gears of lathe.
133	June 12...	" "	"	M	16	End of finger cut on shears.
156	Aug. 1....	" "	"	M	17	Two finger ends cut off; cutting with shears.
45	Jan. 28....	Dickson Bridge Works	Campbellford	M	....	Thumb cut, artery severed; working on lathe.
46	Feb. 1....	" "	"	M	....	Flesh of finger ground off to bone while grinding lathe tool.
92	Apr. 13....	" "	"	M	....	Two fingers crushed; putting grease in cups on drive pulley bearings.
93	" 17....	" "	"	M	....	Eye pierced by small particle of steel flying from a tool.
117	May 7....	" "	"	M	....	Great toe cut; shell dropped off truck.
143	July 1916.	" "	"	M	....	Nose and eye cut; struck by piece of shell while operating lathe.
144	"	" "	"	M	....	Fingers cut; slipped while taking shell out of machine.
145	"	" "	"	M	....	Wrist cut; while tightening a bolt, machine accidently started.
33	Dec. 28, '15.	Dominion Wool Stock Co.	Toronto	M	....	Loss of arm; became entangled in belt of machine.
32	" 18, '15.	Fenelon Falls Planing Mills.	Fenelon Falls	M	....	Shoulder injured; caught in belt.
58	Jan. 3, '16.	Finlay & Sons Co.	Norwood	M	....	Two knuckle joints cut.
166	Sept. 5....	Goodyear Tire & Rubber Co. of Canada	Bowmanville	M	....	Toe crushed and foot swelled; roller fell from stand.
167	" 6....	" "	"	M	....	Forefinger crushed; while stripping tire, the core slipped.
168	" 2....	" "	"	M	....	Lifting tire on stand, tire slipped and fell on ribs.
169	Aug. 10....	" "	"	M	....	Hand cut on stencil while placing tire on stand.
170	" 22....	" "	"	M	....	Head and arm cut; glass fell from skylight.

180	" 22....	" " ..	"	M	55	Deep cut between finger and thumb; came in contact with broken pulley.
181	" 19....	" " ..	"	M	41	Thumb bruised; hit with hammer.
183	Oct. 18....	" " ..	"	M	18	Finger cut while cutting clincher beads.
184	" 3....	" " ..	"	M	25	Fingers bruised; stock book fell on same.
185	" 13....	" " ..	"	M	26	Foot bruised; liner shell fell.
134	May 25....	John Haynes Mill	Millbridge.....	M	11	Burned by boiler explosion.
148	June 14....	McLaren Lumber Co.	Brockville.....	M	....	Face and hands severely burned; while getting fire hose to put out fire, celluloid collar took fire.
71	Mar. 17....	McLaughlin Carriage Co. ...	Oshawa.....	M	43	Two fingers lacerated; band saw broke and small piece flew from same.
72	" 15....	McLaughlin Motor Car Co. ..	"	M	28	Palm lacerated; fell, hand striking piece of metal.
8	Sept. 29....	Muskoka Foundry Co.	Bracebridge.....	M	....	Loss of portion of finger, nail off another; caught in gears of machine.
146	July 11....	Northumberland Pulp Co. ..	Campbellford....	M	60	Ankle hurt; wood block fell from conveyor.
171	Sept. 1....	Port Hope Sanitary Mfg. Co..	Port Hope.....	M	45	Foot burned; molten iron overflowed.
193	Oct. 25....	" "	"	M	38	Thumb cut on circular saw.
109	Apr. 6....	Standard Ideal Co.	"	M	23	Three fingers crushed; caught between grating and hook he was holding.
118	May 8....	" "	"	M	38	Burn on instep; molten iron spilled.
149	July 11....	" "	"	M	58	Fell and strained muscles.
132	June 10....	Trout Creek Logging Co. ...	Trout Creek.....	M	21	*Crushed by falling logs; dumping same at mill.
186	Oct. 21....	Weston Shoe Co.	Campbellford....	M	55	Fell over box and broke a rib.
203	Nov. 19....	Canadian General Electric Co.	Peterborough....	M	27	Tripped on chuck and struck arm against revolving emery wheel.
204	" 24....	" " ..	"	M	44	Eye injured while welding heads on bolts.
205	Dec. 3....	" " ..	"	M	22	Fingers injured; changing bedplates with crane which lowered too quickly.
206	" 13....	" " ..	"	M	19	Finger crushed; caught between dies when punching press-board buttons.
207	" 14....	" " ..	"	M	49	Ruptured, work he was on irritated rupture; operated on.
208	" 23....	" " ..	"	M	55	Elbow injured; door closed striking him on elbow.
209	" 23....	" " ..	"	M	19	Contusion of back of head; struck by falling material.
210	" 29....	" " ..	"	M	28	Scratches on neck, right thumb cut, injury to knee; scaffold broke.
211	Jan. 10....	" " ..	"	M	55	Fingers crushed; came in contact with knives while planing small blocks.
212	Jan. 29....	" " ..	"	M	42	Severe cut on forearm; hand slipped off shifter when working emery wheel.
213	Feb. 11....	" " ..	" ...	M	44	Fingers injured; belt slipped off pulley, crushing fingers between belt and pulley.
214	" 19....	" " ..	"	M	61	Fingers injured and amputated while cutting iron on power shears.

*Fatal.

Office No.	Date	Employer	Place	Sex of Injured Person	Age	Particulars
		DISTRICT No. 8—Concluded				
215	Feb. 25....	Canadian General Electric Co.	Peterborough ...	M	49	Eye burned; while tinning copper, strips molten solder splashed.
216	Mar. 10....	" " ..	"	M	32	Finger injured; hand jammed between shell and cuttings.
217	" 15....	" " ..	"	M	35	Finger injured; while blanking punchings, finger slipped under punch.
218	" 24....	" " ..	"	M	30	Thumb punctured; driving drill.
219	" 25....	" " ..	"	M	38	Fingers injured while pulling out blank from punch and die in press.
220	Apr. 1....	" " ..	"	F	18	Finger injured; working on press.
221	" 13....	" " ..	"	M	69	Fingers badly injured; turning truck over on face plate.
222	" 17....	" " ..	"	M	38	Eye injured; rivetting base end of shell.
223	May 3....	" " ..	"	M	35	Fingers crushed on blanking press.
224	" 3...	" " ..	"	M	70	Fingers crushed chipping motor frames.
225	June 1....	" " ..	"	M	23	Both hands badly burned testing induction motors.
226	" 7....	" " ..	"	M	16	Fingers jammed, second finger pulled off; straightening copper wire in vise.
227	" 23....	" " ..	"	M	34	Strained muscles of back; lifting bearing from floor.
228	July 14....	" " ..	"	M	48	Ankles strained; working on transformer.
229	" 22....	" " ..	"	M	17	Laceration of hand; running planer.
230	Aug. 24....	" " ..	"	M	24	Hand crushed; hand caught between belt and pulley in starting machine.
231	Sept 18....	" " ..	"	M	53	Hand cut requiring two stitches; rolling punchings.
232	" 27....	" " ..	"	M	23	Fingers crushed requiring amputation; setting cutting-off tool.
233	" 29....	" " ..	"	M	18	Forearm injured; tripped going down stairs.
234	Oct. 28....	" " ..	"	M	56	Leg injured; struck against table of hydraulic press.
235	" 31....	" " ..	"	M	45	Fingers injured; unloading motor.

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